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NOVEMBER
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THE ROYAL CANADIAN NAVY 1941-1942

STEEL ROCK IRON MINE



Mother budgets our future now



"What a difference," Mother says, "now there are three people in the house working. It keeps me pretty busy, but believe me, I'm not too busy to think about the future. We don't want our money to slip through our fingers the way it did a few years ago when we were prosperous. My, we were silly. Easy come, easy go, seemed to be Jim's motto in those days. But not this time. We're putting plenty aside for a rainy day."

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"We're not throwing our money around."

We're cutting down here and there, so as to have a decent home for George to come back to, with no fear of the future in it. The bonds help to pay for the war, certainly, but we're doing this for ourselves."

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CANADIAN GEOGRAPHICAL JOURNAL

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THE ROYAL CANADIAN NAVY

1941 - 1942

by Lieut. E. H. BARTLETT, R.C.N.V.R.

THREE years of stern warfare at sea, waged successfully and unceasingly, lie in the wake of the Royal Canadian Navy.

They have been years of severe testing; years which have seen more and more demands being made upon a Service which has grown, steadily and efficiently, to cope with those demands.

Now, matured and confident, the Canadian Navy finds itself at sufficient strength to take an equal share with the navies of Britain and the United States in the primely important Battle of the Atlantic and still have ships and men to draw upon for action in other theatres of war.

To undertake this major role the Navy has accomplished an expansion, in numbers of ships and of men compared with its original strength, unparalleled by any naval power.

The fact that their Navy was acting in equal partnership in the Battle of the Atlantic with the forces of the two greatest naval powers in the world was reported to Canadians by the Minister of National Defence for Naval Services, the Hon. Angus L. Macdonald, B.A. LL.B., S.J.D., when, on May 7th, 1942, he was able, in the House of Commons, to reply to a questioner that convoying from Canada to Britain "is done in part by the Canadian Navy, in part by the British Navy and in part by the United States Navy, with the three sharing in about equal measure".

"Certain sections", he added, "are exclusively under the control of the Canadian Navy."

It was to this proud position that the Navy had, since the very outset of war, been indomitably directing its energies.

Entering the conflict with only six destroyers as its fighting ships (cf. *Canadian Geographical Journal* November, 1940, and November, 1941,) it now is sending its fighting ships to sea in its scores. With less than 2,000 officers and men to man its ships in the immediate pre-war days, it now numbers its personnel at some 48,000.

To increase a Navy approximately thirty-fold would have been a major accomplishment in peace-time. Its accomplishment in three years during which limitless efforts had first to be bent toward actually fighting a bitter war at sea may, with right, be written into the record as one of Canada's outstanding achievements.

This new Navy is no haphazard growth, for in its building a far-sighted, long-reaching plan has been followed. Even in pre-war days, as earlier naval issues of the *Canadian Geographical Journal* have recorded, the Naval Staff had envisioned the task to which the Service would be called, and had laid their plans accordingly. War developments proved their plans were sound. War developments, too, found them fully conscious of future trials to be met, and with far-sighted plans to meet them.

From the beginning, Canada's most important role at sea has been the safe conduct of merchant ships bearing the vital supplies of the New World to the fighting fronts of the Old. It has not been a glamorous role, with dramatic naval actions bringing the Service into the lime-light. The work has been fraught with danger and yet, paradoxically, with monotony as well. Unheralded, the men of Canada's Navy have taken their ships to sea through winter storms and summer fogs, so that the men of the Merchant Navy could deliver their victory-bringing cargoes across the Atlantic Ocean. And, unsung, the naval ships have returned time and time again, ready always to go out and "do the job" once more.

Occasionally, newspaper headlines would tell something of their work — of the safe arrival of a huge convoy of merchant ships; of the addition of yet another troop movement to the long list of other troop movements which had crossed the dangerous waters without the loss of a man. Generally, however, public attention was focused upon the darker side of the picture: on the numbers of merchant ships lost; on the sinkings of invaluable oil

The photograph at the left was taken in a Canadian corvette at sea in comparatively good weather. Nevertheless, her decks were always wet with sea and spray which had "slopped" aboard. The oil-skin clad seaman, caught in a spattering of spray, is shown holding to a life-line to balance himself against the small ship's pitching and rolling.

tankers; on the stories told by survivors brought to friendly ports. A Service which, through experience gained in the last war as well as in this, has learned that to cloak its successes in secrecy brings more successes to its own arm and confusion and loss to the enemy, forebore to change its policy of silence and risk future gains for present credit. Accordingly, news of losses was released much more quickly than news of successes.

Nevertheless, in the House of Commons, the Naval Minister was able to give some figures which presented the Battle of the Atlantic in its true perspective.

"Since the beginning of the war", he said on May 7th, "more than 56,000,000 tons of cargo have been carried from these shores across the Atlantic, and more than 9,000 ships have been convoyed over these waters." These figures did not include troop convoys.

The next day he was able to add the inspiring fact that, of the ships convoyed across the Atlantic, less than one per cent had been lost through enemy action. Losses to unescorted ships were, naturally, much higher . . . approximately four times as heavy.

Dangers run by unconvoyed ships were strikingly marked in the wave of sinkings off the coasts of the United States and

Canada which commenced in the year under review. Coastal shipping, which previously had escaped practically unscathed, became a major target for German U-boats. The list of ships sunk grew steadily longer, and a feeling that the war at sea was going badly for the United Nations was a natural result. Undoubtedly the shipping losses were reaching dangerous figures, figures so high that authorities in the United States declared that ships were being sunk faster than they could be replaced even by the extensive building programme which the democracies had so well in hand. But, once more, the close, dark view obscured the picture as a whole . . . a picture which showed the Atlantic life-line intact, pulling its weight.

The sinkings came closer to Canadian waters.

In the early part of May three ships were sunk in the St. Lawrence. Two months later another two ships were sunk. This was bringing the war to Canada with a vengeance, but sporadic attacks of this nature had not been unexpected by the naval staff. As long ago as November, 1941, Vice Admiral Percy W. Nelles, R.C.N., chief of the Naval Staff, speaking at Oakville, Ontario, had given warning that U-boat attacks off the coast of Nova Scotia were "only a matter of a short



Boat work is still most important in the Navy. Canadian seamen must be prepared to launch their small craft in all weather; to carry boarding parties to enemy vessels; to rescue survivors from friendly ships which have been sunk through enemy action; to land troops and their own men in Combined Operations ashore. It was in a boat similar to

time", and in March, 1942, with Rear Admiral G. C. Jones, R.C.N., then Commanding Officer Atlantic Coast, he told a press conference "we will have submarines in the Gulf of St. Lawrence this summer".

Events proved his prognostications only too true, but the coming of the submarines into near waters did not find the Canadian Navy unready.

The sinkings of U-boats is still a closely guarded secret, but details of incidents are occasionally released which make cheering reading for Canadians. And, even more occasionally, hints have been given that, when the time is ripe and the enemy will no longer benefit from the knowledge gained, a story can be told which will show that the Royal Canadian Navy has been a Nemesis indeed for the undersea boats.

Preface to this story might well be the tale of how H.M.C.S. *Assiniboine*, one of Canada's destroyers, engaged in a running fight with a German submarine which she had caught on the surface. The fight has been described as one of the most dramatic incidents of the war, for it was conducted at such close quarters that the gunners in either craft could, at times, plainly see the faces of their opponents. Gun-fire was exchanged, depth charges were employed and finally the submarine was successfully sent to the bottom when the destroyer rammed her.



Throughout this article on the Royal Canadian Navy, extensive use has been made of talented black and white illustrations from the pen of a Canadian naval officer — Lieut. Edwin Dean McNally, R.C.N.V.R. As corner pieces and as full page illustrations, the drawings bring vivid impressions of the daily life of officers and ratings of the Royal Canadian Navy. They are so vivid, in fact, that they tell their own story — there is little need to give descriptions of them.

Lieut. McNally is serving at sea, and his first-hand experience of sea life combines most happily with his artistic ability.

Born at Fort William, and a graduate of the Fort William Collegiate Institute, he was an artist with the *Winnipeg Free Press* before he joined the Royal Canadian Naval Volunteer Reserve in July, 1940, as a probationary sub-lieutenant. In June, of this year, he was promoted to lieutenant, R.C.N.V.R. His erstwhile profession is now his hobby, lightening his sterner duties as a sea-going officer.

the one shown in the photographs at the left that a boarding party from H.M.C.S. *Chambly*, a corvette, made their way to a German submarine which their ship had disabled. The same small boat was effective in rescuing the German seamen who had abandoned the submarine shortly before she sank. Training in Combined Operations is shown in the photographs at the right and below.





Left:—Filling a long-felt want in the Atlantic seaboard shore life, the Navy League of Canada has opened a fully equipped recreational centre in Halifax. Primarily for the use of seamen, both naval and merchant navy, it is also open to men of the Army and the Air Force. Vice Admiral Percy Nelles, R.C.N., Chief of Naval Staff, declares the grounds open.

Right:—The Hon. F. F. Mathers, Lieutenant Governor of Nova Scotia, takes the salute as naval units march past as part of the ceremonies marking the opening of the recreational centre at Halifax.



Assiniboine, commanded by Acting Lieut. Commander J. H. Stubbs, R.C.N., cruising through a thick fog surprised the submarine on the surface. Instead of endeavouring to dive, the submarine commander sought to escape into the fog and for a few minutes was, indeed, lost from sight. Lieut. Cdr. Stubbs set chase, regained contact and never again lost his quarry until he had despatched her. His ship had superior speed but, much longer than the submarine, was not quite so manoeuvrable. The two vessels were, at

times, so close that the destroyer's main armament could not be brought to bear upon the enemy. Nevertheless, two heavy shells, at least, were sent crashing into the submarine — one through her bows.

Assiniboine did not escape unscathed, for the submarine was using her Oerlikan and machine guns against her. One shell set the destroyer's superstructure afire and another killed one of her seaman (the only fatality). Depth charges were used by the destroyer and one, so close was the action, actually landed on the submarine's deck, from which it rolled to explode beneath her hull. The end came when *Assiniboine* was manoeuvred into position to ram and did so with devastating effect. The majority of the submarine's crew were rescued from the sea into which they had jumped. Her captain had been killed by gun-fire early in the action.

Another of the successes, some details of which have been released, is the tale of how H.M.C.S. *Chambly* sank her first submarine. In company with H.M.C.S. *Moose Jaw*, a sister corvette, *Chambly* was engaged in independent manoeuvres when she contacted a German submarine lying in wait for an oncoming convoy.



Action opened immediately, with depth charges forcing the submarine to the surface where, as she sought to flee, the corvettes engaged with gun-fire. Action continued at close quarters, the submarine being rammed by *Moose Jaw* with a glancing blow which failed to sink her. The submarine captain, however, anxious for his own skin, leaped from his own ship to the corvette as she struck, leaving his command and her crew to their fate.

H.M.C.S. *Chambly*, coming up astern of the submarine, quickly decided that fate. Cowed by the shouted order "stop engines or I'll blow you out of the water" from *Chambly's* captain, the U-boat abandoned her efforts to escape.

The sinking of a U-boat is a success; to capture one is a triumph, and it appeared as if *Chambly* was in good position to achieve a triumph. There was no delay in ordering "Away, boarding party", and equally no delay in the sending away of a sea-boat, manned with armed men and salvage experts, to board the submarine, whose crew by now were lined up on her deck.

It took seamanship to bring the small sea-boat alongside, an added hazard being that some of the Germans, who had jumped into the sea, attempted to climb on board. As they grasped the gunwhale, however, they were beaten back, and the boarding party effected their task.

At once it was seen that salvage was impossible. An engine room artificer and two stokers, who tried to make their way into the engine room compartment, were forced to report that it was flooded out. The First Lieutenant, ignoring warnings from the U-boat crew that "she blow up", descended into the conning tower. Water was already swishing around below him, showing black and oily in the dim light still available. Suddenly a bulk-head gave way, and the swishing water became a flood. Ordering his men from the U-boat, the First Lieutenant left the conning tower for the deck, shouting to the boat to push off for safety as he did so. The boat left the sinking hull just in time, with some of the boarding party having, with the Germans, to swim for it. The First Lieutenant, who had stayed to the last, actually was sucked under by the sinking U-boat, but managed to fight his way to the surface and safety.

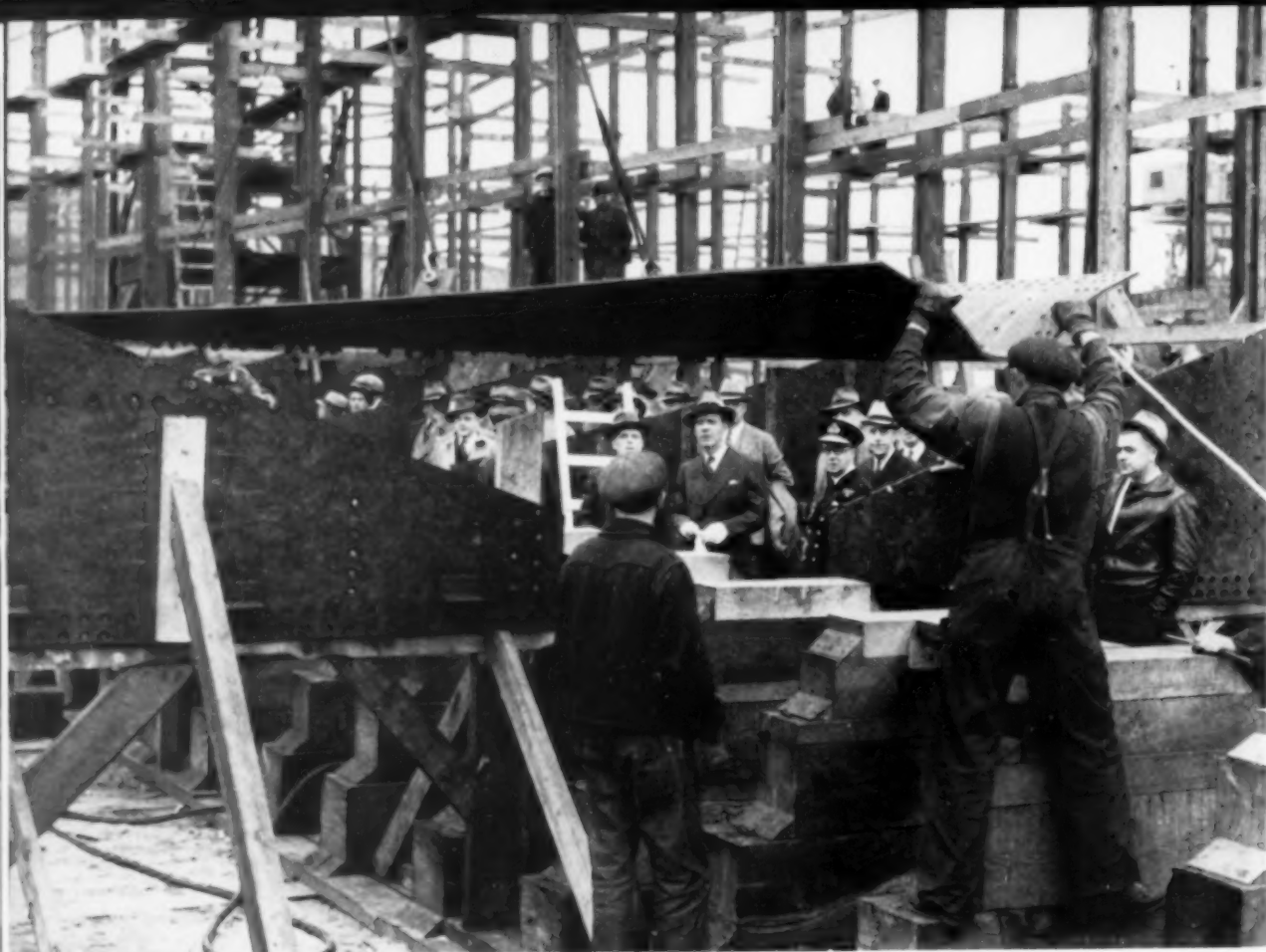
This officer, Lieut. E. T. Simmons, R.C.N.V.R. was one of seven in *Chambly*

to be honoured for the exploit, receiving the Distinguished Service Cross. *Chambly's* captain, Commander J. D. Prentice, R.C.N. (Temp.) was awarded the Distinguished Service Order. Its presentation to him, incidentally, set another precedent for the Canadian Navy, for it was made on the deck of his own ship at the hands of the Governor of Newfoundland, Vice Admiral Sir Humphrey Walwyn, R.N.

The occasion for the presentation taking place in Newfoundland was because Commander Prentice's ship was based there. The Canadian Navy has increased its striking power not alone by men and ships, but by establishing bases as well. Newfoundland, one of the first outposts of the Empire, provides, also, an outpost for Canada, with the setting up of a naval base under the command of a Flag Officer (at that time Rear Admiral L. W. Murray, R.C.N.).

The Newfoundland base was the first Canadian naval centre to come under enemy fire from the sea. In 1940 (cf. *Canadian Geographical Journal*, November, 1941.) the Canadian base in the United Kingdom shared in an air-blitz directed at the port where it was established, but an attack from the sea was unprecedented. Three explosions on the shore of Newfoundland gave warning of





Canada has started to build her own destroyers. Keels for two of the modern "Tribal" class, amongst the largest and most deadly of their kind, have been laid at a Halifax shipyard and their hulls are nearing completion. The Hon. Angus L. Macdonald, first Minister of National Defence for Naval Services, is shown above as the initial keel was lowered into place. He drove home the first rivet and workmen swarmed into action as though a starting gun had been fired. Beside Mr. Macdonald is Vice Admiral Percy W. Nelles, R.C.N.

While Canada is building more destroyers for her ever-growing fleet, the shipyards of the Old Country have not relaxed their efforts. Four "Tribal" destroyers have been built in Great Britain for the Canadian Navy. These bear the names of Canadian Indian tribes — *Athabaskan*, *Huron*, *Troquois* and *Haida*. With eight 4.7-inch guns, torpedo tubes and depth charges, they are formidable fighting units. They have smaller guns, too, and are able to cope with enemy aircraft as well as with the foe, surfaced or submerged, of their own element. The photograph at the left was taken during the building of one of the Canadian destroyers in Great Britain, and shows a Canadian naval rating displaying a very natural interest in the rapid manner in which the ship is taking shape.

the attack. Belief that they had been caused by torpedoes fired at the harbour mouth was proven when a part of a torpedo was found by investigators. The enemy effort was entirely innocuous, for not the slightest damage was done.

The operation of the Newfoundland base gives yet another instance of the close co-operation existing between the naval forces of the United Nations. In addition to the White Ensigns of the Royal Canadian Navy and the Royal Navy, the Ensigns of the United States, Poland, Norway and Free France are worn by the ships which come to the Canadian base for fuel and supplies so that they may continue the Battle of the Atlantic.

More bases have been established in Canada, their locations and their duties still veiled in the official secrecy which makes for safety and efficiency. And, in the United Kingdom, the extent of Canadian naval participation in the waging of warfare on the British side of the Atlantic has led to the establishment of yet another base, a larger and more comprehensive edition of the first one which was set up in the early part of the war.

There was need for a larger base, for the work of the Canadian Navy co-operating with the Royal Navy was bringing hundreds upon hundreds of Canadian seamen to Britain. More than 1,000 officers and ratings, for instance, were serving with the Royal Navy itself in all classes of fighting ships, from battleships down to motor gun boats. Canadian destroyers and corvettes were constantly coming into British ports, bringing with them the convoys they had safely escorted across the Atlantic. Many of the ships of war were based on British ports, and the Canadian base was able to cater to the needs of the ships and their crews.

In the spring of 1942 the senior Canadian naval officer in Britain (Captain R. I. Agnew, R.C.N., O.B.E.) gave the news that yet another part was being played by the Canadian Navy.

Naval ratings, he said, were being trained for combined operations with the Army and the Air Force . . . and "combined operations" by then were synonymous, in the minds of most people, with "commandos". A Canadian naval officer, Lieut. Commander K. S. MacLachlan, R.C.N.V.R., (formerly Deputy Minister for Naval Services) is attached to the staff of Vice Admiral Lord Louis Mountbatten,

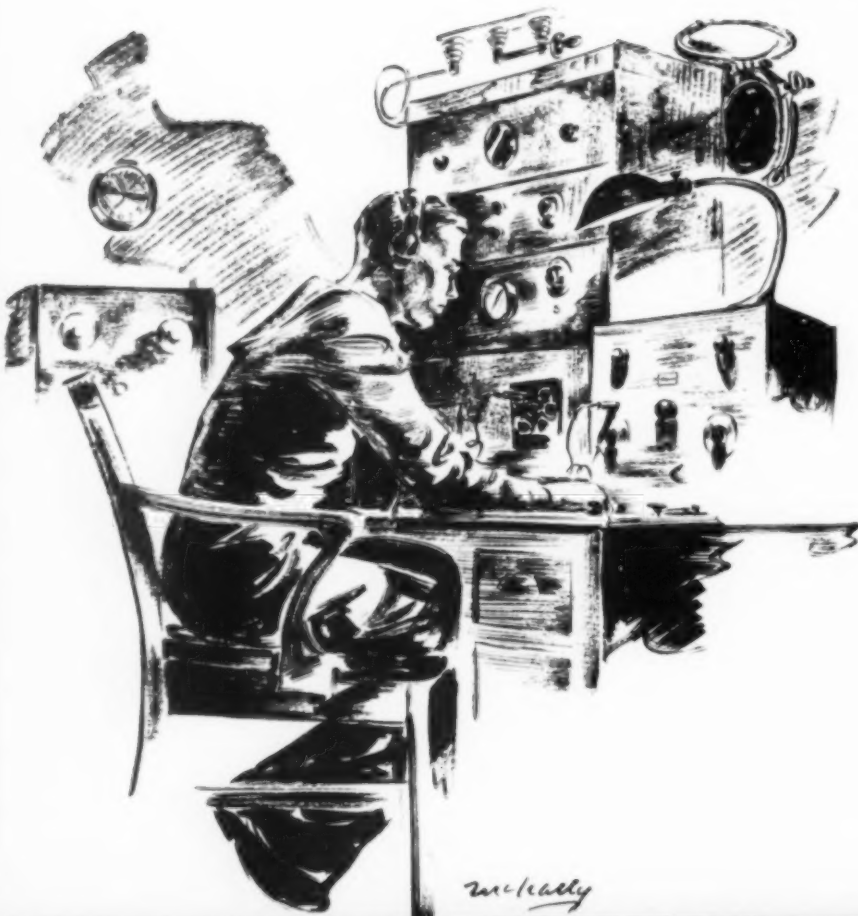


Naval ships are kept at the peak of efficiency and smartness. Here a painting party is at work. The use of camouflage has proven extremely effective, and all naval ships whose duties take them into the danger areas are now painted in weird, but safety-bringing designs.

R.N., D.S.O., G.C.V.O., who is in charge of combined operations.

Captain Agnew permitted himself only the briefest reference to this new phase of Canadian naval activity, and meticulously avoided any description of how many men were involved and for what specific purpose they were preparing.

Months later, however, when the United Nations and their friends thrilled to the news of the raid on Dieppe, spear-headed by men of the Canadian Army, men of Canada's Navy took their share in the epic attack, manning some of the landing craft which took their army comrades into action, and brought many out again. At one sector there was an All-Canadian effort with Canadian soldiers being taken into action in landing craft manned by Canadian seamen. One officer and four ratings lost their lives as part of the price paid by Canada's Navy for participation in



McKee

yet another gallant, fighting venture. From the men of Canada's Army came praise for their naval confreres. And, even as they shared this task with the Royal Navy, so could the Canadian naval men share the tribute paid by Drew Middleton, of the Associated Press, one of the American war correspondents who crossed the Channel with the raiding force and, on his return, wrote of "a long line of landing craft full of weary but triumphant men now passing our ships".

Then he added "they are homeward-bound because of the magnificent job done by the little ships and great seamen of the Royal Navy and the headlong assaults of pilots of the R.A.F.-R.C.A.F."

The "great seamen" of the "little ships" of the Royal Navy have numbered Canadians amongst their ranks almost from the very beginning of the war. Their individual exploits, however, gallant as they have been, have found little prominence in a war-picture painted with a very broad brush. It is, though, not amiss to mention some of them in this review, for in the recording of some of the exploits of these "great seamen" may be presented an idea of the work of all of them.

When, for instance, the German battleships *Scharnhorst* and *Gneisenau*, escorted by the cruiser *Prinz Eugen*, innumerable surface craft and an umbrella of aircraft made their way up channel, a Canadian officer shared in one of the attacks upon them.

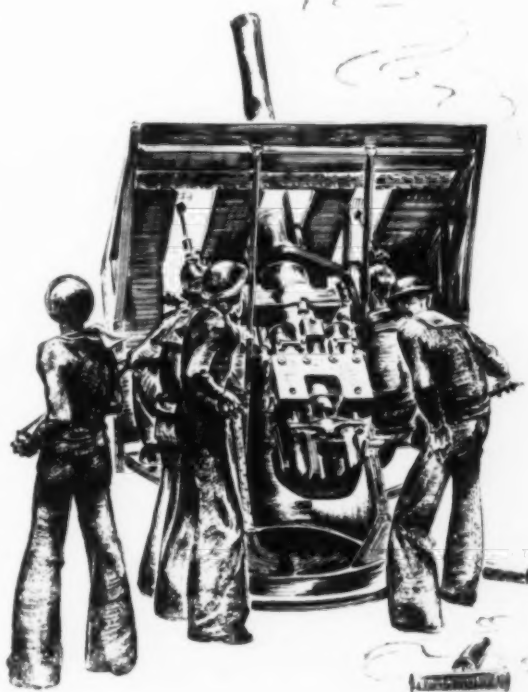
He was Lieut. Anthony Law, R.C.N.V.R. Commanding Officer of a motor torpedo boat in the Royal Navy. It was a bold venture, attacking what was, in effect, a battle fleet with such miniature craft. Boldness was repaid for the attacking force was able to report that at least one torpedo was sent into the German cruiser. Lieut. Law withdrew his small command, intact. This "incident" earned for him a mention in despatches.

In motor torpedo boats and in motor gun boats Canadian officers have had many brushes with the enemy, scoring their successes but counting them only as part of the day's work. Commendation came to another officer, Lieut. J. Maitland, R.C.N.V.R., for sinking a much more heavily armed German trawler. He ran his small craft almost alongside the enemy vessel, and despatched her by well-laid depth charges. Another officer attacked a German destroyer, and left his mark

upon a ship which was a veritable Goliath to his David. Encounters with German E-boats have been more than frequent, for it is part of the task of the small ships of the Navy to keep the seas free of these hit-and-run raiders.

In the Channel and off the east coast of England Canadians have seen plenty of action. They have manned minesweepers, so that cargo ships may make their voyages with protection from this peril, and in minesweepers have repelled attacks from aircraft as well as surface craft, often to the destruction of the attackers. One Canadian officer's ship came under twenty-eight attacks in thirty-three trips, without harm to herself but with the seen destruction of three German bombers and the possible destruction of even more, for more than one was repulsed with severe damage. Canadian officers have served in rescue launches, detailed to save British flyers who parachuted from their planes.

While these Canadians in their diverse duties are writing their own page of naval history, others of their number serving with the Royal Navy are seeing action in all quarters of the globe. There were Canadians in H.M.S. *Prince of Wales* when, with H.M.S. *Repulse*, she was sunk by the Japanese. Canadians know action in



the Indian Ocean and the Persian Gulf and the Mediterranean. There are experts detailed for special duties the nature of which are in such a "hush-hush" category that no mention of them is ever made, and, although the experts have their place in the Honours list of the Navy, no clue as to how they gained their awards is given in the citations.

The Honours list, nevertheless, does tell part of the story of the Navy's work.

Since the November, 1941, issue of the *Canadian Geographical Journal*, in which were recorded the names of 23 officers and 26 ratings who had been honoured to that date, some 50 officers and 16 ratings have been awarded decorations or mentioned in despatches. A listing of the centres (where available) where the officers and ratings make their homes in Canada shows, too, how all sections of the Dominion are represented. These are the additional names:

DISTINGUISHED SERVICE ORDER

JAMES D. PRENTICE — Commander, R.C.N., D.S.O. (Victoria, B.C.). For services in H.M.C.S. *Chambly* on the occasion of her successful encounter with an enemy submarine.

DISTINGUISHED SERVICE CROSS

JOHN A. R. ALLAN — Sub. Lieut., R.C.N.V.R., D.S.C. (Winnipeg, Man.). For services in H.M.C.S. *Chambly* on the occasion of her successful encounter with an enemy submarine.

WILLIAM EDWARD SLADE BRIGGS — Acting Lieut.-Commander, R.C.N.R., D.S.C. (Halifax, N.S.). Acting Lieut.-Commander Briggs, while in command of H.M.C.S. *Orillia*, displayed great initiative and tenacity of purpose in oiling at sea from the torpedoed tanker *Tachee*, which tanker, as a result of Lieut.-Commander Briggs' excellent seamanship and ingenuity was saved. This officer has rendered excellent and invaluable service with convoys generally during a long period of time.

CHARLES E. BONNELL — Lieutenant, R.C.N.V.R., D.S.C. (Newtonbrook, Ont.). On duty with the R.N. — Awarded the Distinguished Service Cross.

A. W. CLARK — Surgeon Lieut., R.C.N.V.R., D.S.C. "For devotion to duty in action".

GORDON P. FAHRNI — Surgeon Lieut., R.C.N.V.R., D.S.C. (Winnipeg, Man.). Awarded the Distinguished Service Cross for bravery and devotion to duty.

THOMAS G. FULLER — Lieutenant, R.C.N.V.R., D.S.C. (Ottawa, Ont.). For distinguished conduct aboard H.M. ship on duty in the English Channel.

EDWARD T. SIMMONS — Lieut., R.C.N.V.R., D.S.C. (Victoria, B.C.). For service in H.M.C.S. *Chambly* on the occasion of her successful encounter with an enemy submarine.

EDGAR G. SKINNER — Lieut.-Commander, R.C.N.R., D.S.C. (Fredericton, N.B.). Lieut.-Comdr. Skinner has displayed great devotion to duty and given invaluable service in connection with the escort of convoys during exceptionally severe winter months. This Officer when left as Senior Officer of the Escort, has consistently shown himself capable of carrying responsibility, and by his exemplary conduct, initiative and resource has set an example to others and thus improved the efficiency of those under his Command.

C. W. STEAD — Lieutenant, R.C.N.V.R., D.S.C. Awarded the Distinguished Service Cross "for mine-sweeping at Malta".



Leaving its grim work of hunting down the undersea enemy, Canada's Navy plays also a continuing roll of mercy on the North Atlantic. In this picture, survivors from a torpedoed merchantman crowd the after deck of a corvette just in from convoy escort duty.



Commander James Prentice, R.C.N., D.S.O., was presented with his decoration on the deck of his own ship (H.M.C.S. *Chamblly*) which he had taken into successful action with an enemy submarine. The ceremony took place at Newfoundland, where the Canadian Navy has established a base, and was performed by the Governor, Vice Admiral Sir Humphrey Walwyn, R.N., who is here seen shaking hands with Commander Prentice.

GEORGE HAY STEPHEN — Acting Lieut.-Commander, R.C.N.R., D.S.C. Acting Lieut.-Commander Stephen, by the display of great initiative and resource, succeeded in salving the S.S. *Imperial Transport* and having it towed to Newfoundland. This Officer has displayed great devotion to duty and given invaluable service in connection with the escort of convoys during exceptionally severe winter months. Lieut.-Commander Stephen, when left as Senior Officer of the Escort, has consistently shown himself capable of carrying responsibility and by his exemplary conduct has set an example to others and thus improved the efficiency of those under his Command.

JOHN McDONALD RUTTAN — Sub-Lieut. R.C.N.V.R., D.S.C. Awarded the Distinguished Service Cross — "for bravery and endurance while minesweeping, and when attacked by enemy aircraft".

JOHN MORTIMER DAVIES — Lieut. R.C.N.V.R., D.S.C. (Saint John, N.B.). Awarded the Distinguished Service Cross on the occasion of the Celebration of His Majesty's Birthday.

ROBERT C. MACMILLAN — Lieut. R.C.N.V.R., D.S.C. and Bar (Charlottetown, P.E.I.). Awarded the Distinguished Service Cross, "for outstanding zeal, patience, and cheerfulness and for setting an example of wholehearted devotion to duty, without which the high tradition of the Royal Navy could not have been upheld". — Awarded Bar to Distinguished Service Cross — "for bravery and endurance while minesweeping and when attacked by enemy aircraft. H.M.S. *Skudd III*."

PETER A. R. THOMPSON — Lieut. R.C.N.V.R., D.S.C., (Oakville, Ont.). "For courage, skill and seamanship in action against the enemy while serving in H.M. motor gun boats. In addition, Lieut. Thompson has been twice mentioned in despatches, once in 1940 and again, in 1942, for "gallantry in action with escorted convoy".

ANDREW A. WEDD, — Sub-Lieut., R.C.N.V.R., D.S.C. Awarded the Distinguished Service Cross "for gallantry, daring and skill in the combined attack on Dieppe".

Citation: "This officer was wounded in the shoulder whilst landing the R.M.R.'s at 0700 with the 4th and 5th L.C.P. flotilla on the main beaches. Boats were under fire from the cliffs during

the run-in, and for the last 200 came under intense fire from all of the buildings in front of the beach as well as from the cliffs. Having landed his troops this officer withdrew his boat and went alongside the destroyer where his wound was dressed. Later, at about 0930, he attempted to land a party of Canadian officers and N.C.O.'s with a special high forward radio. The landing was not successful as fire was too heavy and the craft had to withdraw after approaching to within about 100 yards of the beach.

DISTINGUISHED SERVICE MEDAL

- WILLIAM SPENCE — Chief Engineer Art. R.C.N.V.R., D.S.M., V17088. For services in H.M.C.S. *Chambly* on the occasion of her successful encounter with an enemy submarine.
HUGH EUGENE TOBIN — Signalman V8336, R.C.N.V.R., D.S.M. (Hamilton, Ont.). For services in H.M.C.S. *Chambly* on the occasion of her successful encounter with an enemy submarine.

GEORGE MEDAL

- WILLIAM G. TELLIER — Lieut. R.C.N.V.R., George Medal (Montreal, Que.). Awarded the George Medal "for courage and coolness".
DENNIS JAMES O'HAGAN — Lieut. R.C.N.V.R., awarded the Bar to George Medal (Halifax, N.S.).
GEORGE DOUGLAS COOK — Lieut. R.C.N.V.R., awarded the Bar to George Medal.

CROSS OF VALOUR

- ROBERT B. FAULK — A/Ldg. Smn. R.C.N. 2600, Cross of Valour (Polish) (Krzysz Walecznych) (Picardville, Alta.). In recognition of services during the withdrawal of Polish Forces from France in 1940 (H.M.C.S. *Restigouche*).
H. N. LAY — Commander, R.C.N., Cross of Valour (Polish) (Krzysz Walecznych). In recognition of services during the withdrawal of Polish Forces from France in 1940 (H.M.C.S. *Restigouche*).
ROY SMITH — Ch. E.R.A. 2nd Class R.C.N. 21201, Cross of Valour (Polish) (Krzysz Walecznych) (Hamilton, Ont.). In recognition of services during the withdrawal of Polish Forces from France in 1940 (H.M.C.S. *Restigouche*).
NEVILLE TAYLOR — P.O. Steward R.C.N. 2372, Cross of Valour (Polish) (Krzysz Walecznych) (Winnipeg, Man.). In recognition of services during the withdrawal of Polish Forces from France in 1940 (H.M.C.S. *Restigouche*).

ALBERT MEDAL

- CHARLES A. KEEFER — Lieut. R.C.N.V.R., for gallantry in attempting to save life at sea, posthumously awarded the Albert Medal.

DESPATCHES

- DOUGLAS B. ARMSTRONG — Sub-Lieut. (S.B.) R.C.N.V.R., Despatches (Toronto, Ont.).
GRAHAM M. BAKER — Lieut. R.C.N.V.R., Despatches. Posthumous mention in despatches for good service at St. Nazaire.
WALLACE HAROLD CHANDLER — Stoker Petty Officer, Despatches, R.C.N.R., A.1855 (East Saint John, N.B.). During the sinking of H.M.C.S. *Windflower*, in spite of recurring disasters and surrounded by explosions and escaping live steam, Stoker Petty Officer Chandler exhibited steadiness and coolness, and in refusing to leave the engine room until satisfied that all others had left, displayed courage and gallantry worthy of the best naval traditions.
JOSEPH GEORGES CHARRIER — Acting Leading Seaman, Despatches. R.C.N. 3167. During the sinking of the H.M.C.S. *Windflower*, in spite of recurring disasters and surrounded by explosions and escaping live steam, Leading Seaman Charrier exhibited steadiness and coolness. His conduct throughout was marked by outstanding courage.
ERIC S. DITMARS — Sub-Lieut. R.C.N.V.R., Despatches. Mention in despatches for gallantry and distinguished services in operations in Greek waters, H.M.S. *Salvia*.
JULIEN DUCHESNE — Acting Chief Petty Officer, R.C.N. 2507, Despatches (Montreal, P.Q.). During the sinking of H.M.C.S. *Windflower*, in spite of recurring disasters and surrounded by explosions and escaping live steam, Acting Chief Petty Officer Duchesne exhibited steadiness and coolness and by his courageous conduct and example undoubtedly saved a number of lives.
GEORGE FINDLAY DUNCAN — Lieut. R.C.N.V.R., Despatches (Toronto, Ont.). Mentioned in despatches — "for leadership coolness, and skill in action against the enemy".
GILBERT GOODWIN FRASER — Lieut. R.C.N.V.R., Despatches (Victoria, B.C.). Lieutenant Fraser, during sinking of H.M.C.S. *Windflower*, in spite of recurring disasters and surrounded by explosions and escaping live steam, exhibited steadiness and displayed coolness and gallantry and carried out his duties on board the ship until she sank to the level of the water, thus setting an inspiring example to those about him. By his courageous conduct he undoubtedly saved a number of lives.
THOMAS GILMOUR — Acting Lieut.-Commander, R.C.N.R., Despatches (Montreal, Que.). Acting Lieut.-Comdr. Gilmour has consistently, for a long period of time, done invaluable work in connection with the escort of convoys during exceptionally severe winter months. With respect to the attempt to save F.F.S. *Alysse*, he displayed seamanship of a high order and conducted himself in an entirely commendable manner throughout.
FREDERICK E. GRIFFIN — Lieut. R.C.N.V.R., Despatches (Winnipeg, Man.). Mention in despatches for courage and enterprise in operations in the Persian Gulf.
ROBERT E. GEORGE — A/Ldg. Stoker, A1220, Despatches (Canning, N.S.). For good service in H.M.C.S. *Moose Jaw* in action against enemy submarines and in rescuing survivors from a merchantman.



Most deadly weapon against the U-boats, and most feared by their crews, is the depth charge. Fired in "patterns", depth charges may be set to explode at different levels, the effect of their explosions making itself felt over a wide range. Carrying 350 pounds or more of high explosives, they can do immense damage to the submarines. Unless, however, the Navy has definite proof that a submarine has been destroyed, a claim to that effect is not made. Nevertheless it is extremely likely that those which are listed only as "probable" successes have been so seriously damaged that they have not survived to return to their bases. The first of the photographs at the right shows a depth charge being fired from a "thrower", which propels it far outboard to form part of the death-dealing "pattern". The second photograph shows the thrower being reloaded, a matter of only a few seconds, and the third picture shows the loading of charges onto the "rails" by which they are dropped over the stern.



JOHN CHARLES GRIFFITHS — Chief Engine Room Artificer, R.C.N.V.R., V11436, Despatches (North Battleford, Sask.). On October 10th, 1941, a leak developed in H.M.C.S. *Brandon* whilst at sea in a gale, and water entering the engine room appeared to be beyond control. Chief Engine Room Artificer Griffiths displayed initiative and resource of a high order in gaining control of the leak under the worst conditions possible.

It was due to his efforts that way was kept on the ship enabling her to ride the gale when a heavy sea aboard would have meant disaster. Chief Engine Room Artificer Griffiths, by his zealous and courageous conduct, set an example to those around him worthy of the best naval traditions.

FREDERICK ERNEST GRUBB — Lieut. R.C.N., Despatches (Halifax, N.S.). For good service in H.M.C.S. *Moose Jaw* in action against enemy submarines and in rescuing survivors from a merchantman.

C. T. D. HYSLOP — Sub-Lieut. R.C.N.V.R. (Hamilton, Ont.). — Despatches. "For good service in escort of a convoy to Malta. He is recommended for devotion to duty, cheerfulness in trying conditions and untiring and efficient service."

THOMAS ELLIS LADNER — Sub-Lieutenant, R.C.N.V.R. (Temporary). — Despatches. "For bravery and skill when H. M. motor gun boats attacked and sank a laden enemy tanker, and severely damaged two escorting trawlers off the French Coast."

CHARLES ANTHONY LAW — Sub-Lieut. R.C.N.V.R., Despatches (Quebec, P.Q.). Mentioned in despatches — "for daring and resolution while serving in H.M. destroyers, torpedo boats, and motor gun boats in daylight attacks at close range and against odds, upon the German battle cruisers *Scharnhorst* and *Gneisenau* and the cruiser *Prinz Eugen*."

HAROLD E. T. LAWRENCE — Sub-Lieut. R.C.N.V.R., Despatches (Halifax, N.S.). For good service in H.M.C.S. *Moose Jaw* in action against enemy submarine and in rescuing survivors from a merchantman.

DAVID JAMES LEWIS — Sub-Lieut. R.C.N.V.R. Despatches. "For cheerfulness and disregard of danger whilst re-embarking enemy troops under heavy fire."

L. B. McILHAGGA — Sub-Lieut. R.C.N.V.R. Despatches. Mentioned in despatches "for good service in engagement with R-boats."

B. McINTYRE — Ord. Seaman, R.C.N.V.R. Despatches. Mentioned in despatches "for gallantry, daring and skill in the combined attack on Dieppe."

"Coxswain B. McIntyre, O.D., L.C.A. 259, took over command of his L.C.A. when the flotilla officer became a casualty in the initial landing. This Coxswain cleared a fouled propeller, placed his craft alongside a destroyer and transhipped Lieut. Dreach, the flotilla officer. Then McIntyre joined up with the flotilla again, finally bringing his craft safely back to England when so ordered."

NORMAN MITCHINSON — Ord. Seaman, R.C.N.V.R. Mentioned in Despatches "for gallantry, daring and skill in the combined attack on Dieppe."

"N. Mitchinson, A.B., Lewis gunner of L.C.A. 285 under the command of Lieut. J. E. Koyl, R.C.N.V.R. The L.C.A. was lying awaiting orders about one mile off Dieppe pier. Junkers 88 was seen approaching, attacking en route a destroyer and other small craft. Mitchinson held his fire until the plane was almost overhead. From his fire, tracer was observed to be pouring into the plane's port wing. This caused the wing to break off at the place where the bullets were seen to enter and the plane crash-dived into the sea about 300 yards inshore of L.C.A. 285."

STUART G. MOORE — Sub-Lieut. R.C.N., Despatches (Vancouver, B.C.). Mention for courage and resourcefulness aboard destroyer during severe storm.



FREDERICK MORGAN — Leading Signalman, R.C.N.R., B.284, Despatches (Armdale, Halifax Co., N.S.). During the sinking of H.M.C.S. *Windflower*, in spite of recurring disasters and surrounded by explosions and escaping live steam, Leading Signalman Morgan exhibited steadiness and coolness. His conduct throughout was marked by outstanding courage.

HENRY ATHELSTON MOXLEY — Lieut. R.C.N.V.R., Despatches (Toronto, Ont.). Mention for skill in action against enemy submarines.

GLEN ALLEN NORTHGRAVE — Sub. Lieut. Mentioned in despatches "for gallantry, daring and skill in the combined attack on Dieppe. Had conducted himself in a cool manner and carried out his duties under enemy fire."

ANTHONY F. PICKARD — Mate, R.C.N.R., Despatches (South Porcupine, Ont.). Mention for services in H.M.C.S. *Chambly* on the occasion of her successful encounter with an enemy submarine.

LEO PAUL LEHTO — Able Seaman, R.C.N.R., A.4022, Despatches (Sioux Lookout, Ont.). Mention for services in H.M.C.S. *Chambly* on the occasion of her successful encounter with an enemy submarine.

H. WM. RUDDLE-BROWNE, Mate R.C.N.R., Despatches. For good service in H.M.C.S. *Moose Jaw* in action against enemy submarines and in rescuing survivors from a merchantman.

ARTHUR JAMES SHARPE — Able Seaman, R.C.N., 2789, Despatches. During the sinking of H.M.C.S. *Windflower*, in spite of recurring disasters and surrounded by explosions and escaping live steam, Able Seaman Sharpe exhibited steadiness and coolness. His conduct throughout was marked by outstanding courage.

DOUGLAS B. SYMONS — Lieut. R.C.N.V.R., Despatches. Mention in despatches for good services in actions against aircraft and enemy supply ships.

DONALD M. WATERS — Midshipman, R.C.N., Despatches (Toronto, Ont.). Mention in despatches for Battle of Crete.

MAURICE SAMUEL HARTLEY — Lieut. (SB) Despatches, 11-6-42 (London, Ont.).

CYRIL F. KITCHEN — Stoker, R.C.N.R., A.1571, posthumously mentioned in despatches "for devotion to duty".

C. PETERSON — Lieut. R.C.N.R. (Victoria, B.C.). "For good services in life saving".

JOHN POWELL — Sub-Lieut. R.C.N.V.R., "for services in the capture of Diego Suarez".

DONALD MARSHALL SUTHERLAND — Sub-Lieut. R.C.N.V.R., Despatches, 6-1-42 (Weston, Ont.). Mention in despatches "for courage and skill in carrying out hazardous duties".

JAMES SUTHERLAND WILSON — Lieut.-Cdr. R.C.N.V.R., Despatches, 11-6-42.

F. E. K. UDELL — Lieutenant, R.C.N.V.R. (Montreal, Que.). Despatches. "For good service in action with an Italian submarine. He displayed great resource and determination as the gunnery control officer during a surface action with the Italian submarine. His orders were clear and his judgment accurate and a considerable measure of the success of our gunnery was due to his direction."

COMMENDATIONS

JAMES LESLIE PERCY — Lieut. R.C.N.V.R., Commendation. Commended for "good service in the protection of convoys".

TESTIMONIAL

JOHN L. S. CUNNINGHAM — Lieut. R.C.N.V.R. (Victoria, B.C.). Awarded Testimonial on Parchment of the Royal Humane Society in respect of an act of gallantry performed July 19, 1941, in rescuing Edward Dainton, Ldg. St. R.N.



Honours cannot be gained without cost, without the accompaniment of a grimly-reading casualty list. The Canadian Navy has paid its price for successes against the enemy, a price exacted in losses of both men and ships.

September of 1942 was a month of heavy blows for the Navy. Within eight days the Naval Minister was called upon to announce the losses of three ships from enemy action. The first was H.M.C.S. *Raccoon*, an armed patrol vessel. She was torpedoed. Her Commanding Officer (Acting Lieut. Cdr. John N. Smith R.C.N.R.), three of her officers and her entire crew of thirty-three were presumed lost with her. Five days later the loss of H.M.C.S. *Charlottetown*, a corvette, from a torpedo attack was also announced. Her Commanding Officer (Acting Lieut. Cdr. John Willard Bonner, R.C.N.R.) and five ratings were reported missing, believed killed in action. Three other ratings died of injuries.

The most severe blow came three days later when it was announced that H.M.C.S. *Ottawa*, one of Canada's destroyers, had been torpedoed and sunk. Her casualty list was long, for her Commanding Officer, Lieut. Cdr. Clark Anderson Rutherford, R.C.N., four officers and one hundred and seven ratings were reported missing, believed killed in action. One other rating subsequently died of wounds. Five officers and sixty-five ratings and six Royal Navy ratings were rescued.

These three announcements brought the list of ship losses in the twelve months

In a Canadian naval base in the United Kingdom, air and gas raid drills are a very necessary part of the training. The photographs at the right show members of the "decontamination squad" at work. The photograph below shows a section of the base's own fire-fighting squad in action. In one raid on a city in which Canada had established a naval base, Canadian officers and ratings earned the grateful praise of the citizens for the help they gave in fighting fires and saving lives.







The first Naval Board (above) constituted for the Royal Canadian Navy. Presiding is the Minister of National Defence for Naval Services, the Hon. Angus L. Macdonald. Sitting at his right is the Chief of Naval Staff, Vice Admiral Percy W. Nelles, R.C.N., with Commodore Howard E. Reid, R.C.N., and Captain H.T.W. Grant, R.C.N. Facing Commodore Reid is Engineer Captain George L. Stephens, R.C.N. and facing Captain Grant is Captain Godfrey M. Hibbard, R.C.N. At the extreme right is Mr. W. Gordon Mills, Deputy Minister for Naval Services and civil and financial member of the Board, and at the extreme left is Paymaster Com. Robert A. Pennington, R.C.N.V.R., Secretary to the Board.

Top left:—The men on whose broad shoulders rests the safety of Democracy's Atlantic life-line. This group represents a typical corvette ship's company. Here are men from every province of the Dominion — from the wheat fields, the mining camps and the logging roads, the small-town shops and the city offices.

Bottom left:—The Chief of Staff pays his men a visit. Maintaining first-hand knowledge of the progress and the needs of ever-growing naval bases, Vice Admiral Percy W. Nelles, is shown here as he inspected recently constructed buildings in Newfoundland. At left, is Rear Admiral L. W. Murray, at the time Flag Officer, Newfoundland Forces, now Commanding Officer, Atlantic Coast.

Another leg of Vice Admiral Nelles' inspection tour took him to the Pacific Coast where he examined shore defences from the bridge of a Fairmile submarine chaser (right). With him on the bridge, extreme right, is Commodore W. J. R. Beech, Commanding Officer, Pacific Coast.





One of Canada's auxiliary cruisers, her largest ships of war. When this photograph was taken this ship was carrying a number of Canadian soldiers in training for Combined Operations. The auxiliary cruisers are armed with 6-inch guns and have a secondary armament capable of dealing with aircraft as well as surface craft. Their speed is high, the exact figure being unrevealed.



The work which is accomplished by Canadian corvettes has brought them fame. These efficient escort ships are armed to deal with submarines or aircraft. They are magnificent sea boats and face the Atlantic undaunted by any weather. Their long cruising range enables them to go far afield in the course of their duties.



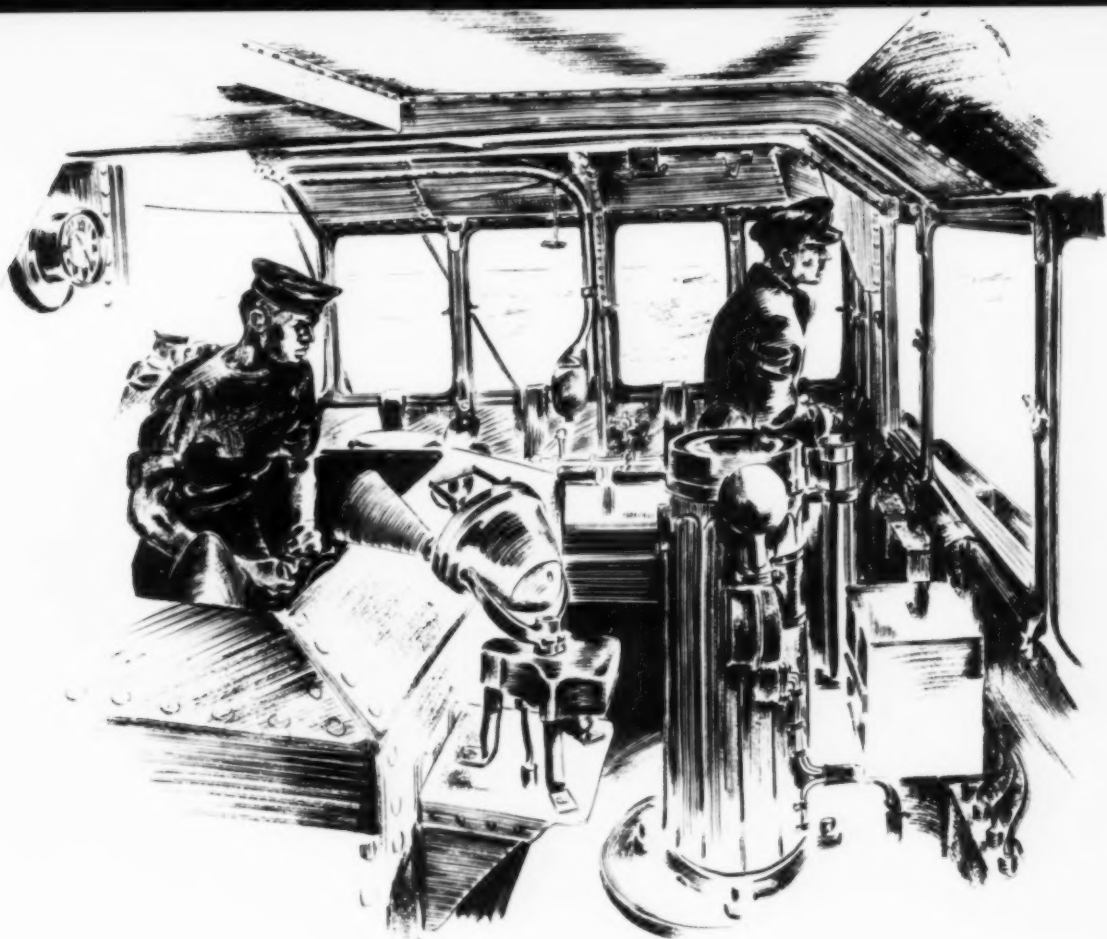
Submarine chasers of the "Fairmile" class have been built in Canadian shipyards. They are listed as "C.M.L.s" or Canadian Motor Launches, worthy successors to the famous "M.L.s" of the last war. Sturdily constructed, and of proven ability as sea boats, they are armed with small guns although the depth charges they carry are their main weapon against the submarines they hunt. The above photograph shows a "C.M.L." on patrol. Below is shown some of the anti-aircraft equipment in a corvette.



under review to a total of five. The two previous losses were H.M.C.S. *Spikenard* and H.M.C.S. *Windflower*, both corvettes. The names of the five ships had to be written on the roll which already bore the names of *Fraser* and *Margaree*, destroyers; *Levis*, corvette; *Bras d'Or* and *Otter*, patrol ships.

The close of September saw the casualty list reporting 70 officers and 588 ratings killed on active service; 9 officers and 63 ratings dead from other causes; 6 officers and 85 ratings wounded or injured and 6 officers and 3 ratings held as prisoners of war.

The loss of experienced officers and ratings was grave, but a steady flow of successors to them was by now making itself felt. The need for experienced officers had, from the very beginning, been one of the ever-present problems which the Navy had faced. As recorded in previous naval issues of the *Canadian Geographical Journal* there had been,





To the end that mines, sown by enemy submarines, may not imperil the merchant ships entering and leaving Canadian ports under their protection, R.C.N. minesweepers are on continuous duty. Here (at the left) two of them are seen proceeding from an East Coast port to clear the sea lanes of mines.

Heading seaward from a port in the United Kingdom, two of Canada's ships of war (lower photograph) seek the opportunity to engage the enemy.





Above:—From the foredeck of one of their sisters, three "C.M.L.s" are seen proceeding on patrol.

Canada's ships of war are now numerous enough to proceed to sea in flotillas. To the right, corvettes are shown manoeuvring to take up convoy escort stations. The expansion of the Canadian Navy to the point where its ships now undertake a third of the Atlantic escort and convoy work is an outstanding achievement. The calls made upon its ships, however, are so heavy that the Naval Minister, in October, drew attention to the heavy strain which the Navy was meeting and to the need for unabated construction of fighting ships for the protection of the vast new fleets of merchant ships which are being built in the shipyards of Canada and the United States.



fortunately, a large reserve of trained officers, officers from the retired list of the Navy or from the Merchant Marine, who had capably filled the breach when the first need was felt. This reserve, quite naturally, was not inexhaustible but, before it had been drained, a new supply of fully-qualified officers was ready.

It was a supply brought about as the natural result of three years of sea-warfare, with ships and men constantly on duty. Experience is inestimably more valuable when bought first-hand, by actual meeting with the enemy and by actual encounter of the problems and hazards of navigation in wartime, through all weathers and in all circumstances. Officers who, serving as seconds-in-command of Canada's ships had bought their experience in this most practical way, now were ready to assume command themselves.

There was need of them.

Canadian shipyards, geared to war-time speed in production, were doing their

part in building the ships. The Navy had the task of manning them . . . efficiently.

It was a gargantuan task.

That the Navy, which had needed about a dozen ship-captains at the outbreak of war, now could muster them in their scores was a *fait accompli* accepted with little, if any, surprise.

The need for trained officers was not confined to sea-going ships. Expansion of pre-war bases and the setting up of new ones called for more and more officers for the direction of their many-times expanded activities. Staff work was increased, and the demand for officers for operational duties increased with it.

Methodically the Canadian Navy met the ever-growing demands. In previous issues of the *Canadian Geographical Journal* has been told how the appointment of a Minister of National Defence for Naval Services (the Hon. Angus L. Macdonald, on July 8th, 1940) saw, for the first time, the Senior Service given its own separate



Not alone in their own ships, or in the ships of the Royal Navy, do men of Canada's Navy carry the fighting to the enemy. Many of them are attached to the merchant ships of the United Nations as gunners or signalmen. They are known as "D.E.M.S. Ratings", the "D.E.M.S." representing "Defensively Equipped Merchant Ships". In these ships they man the heavy guns carried as protection against surfaced submarines, and the anti-aircraft armament against the sky-raiders. Successes have rewarded their fighting skill, casualties have, as is the price of war, been inflicted. At the left, a "D.E.M.S. Rating" is shown searching the sea for signs of the enemy. His gun, in the background, is ready.



This striking photograph was taken at the conclusion of yet another successful Atlantic crossing. Canadian warships are shepherding their convoy safely into a British port. The merchant ships can be seen to the right.



Heading into Atlantic rollers, the destroyer shown at the left has "taken a big one" over the bows. Throwing spray far and high, she ploughed on her way undeterred.

The Atlantic life-line has held firm through more than three years of war, and the Royal Canadian Navy has had its part in maintaining this proud record. To-day one-third of the escorting of convoys from the battle of the Atlantic is undertaken by the Canadian Navy. The photograph below, taken from the deck of an escort ship, shows a section of a typical convoy.

Not all the men who are fighting the battles of the Atlantic are in uniform. The men of the merchant navies of the United Nations are in the front line without cessation. At the right, one of them is shown. Dungaree-clad and sea-booted, he is very much a fighting seaman.



entity in the Department of National Defence. The year under review was to see further developments in this way.

A Naval Board was set up to act in an advisory capacity to the Minister, and naval administration was shaped to correspond more closely with that in force in the United Kingdom. The change was not made without a great deal of forethought and consideration, and a close study of the systems in force in the United Kingdom (with the background of centuries of catering to the needs of a fighting navy) and Australia (where the particular needs of a Dominion force has been given full attention). The Canadian result was a careful adaptation of the best points of each.

The Naval Board, acting in an advisory capacity to the Minister, in effect, parallels the Board of Admiralty of the Old Country. In place of Sea Lords, Canada has named Naval Members, the First being the Chief of Naval Staff. The Second Naval Member is the Vice Chief of Naval Staff, and others are the Chiefs of the departments of Personnel, Equipment and Supply, and Engineering and Construction. Completing the Board is the Financial and Civil Member, the Deputy Minister for Naval Service whose office corresponds to that of the Civil Lord on Britain's Admiralty, even as the office of Naval Minister corresponds to that of the First Lord of the Admiralty. The Secretary of the Naval Board is also the head of the Naval Secretariat, which co-ordinates all Naval Service Headquarters' activities.

The board holds sway at Ottawa, where Naval Service Headquarters are located. Here is the nerve-centre of Canada's Navy; from here the broad policy of operations is determined. Here, too, meets the Naval Staff, with the Directors of Trade, Plans, Operations, Signals and Intelligence working in conjunction with the Chief and Vice Chief of Staff, who thus head both entities.

The Naval Board and the Naval Staff are so constituted that at all times their members, between them, know the resources they have with which to fight the war at sea — what ships are available for emergent duties, which ships temporarily out of commission for repair or refit; what ships are at sea, and which are awaiting



orders; where extra officers and men will be needed to man new ships awaiting their commissioning. All the problems of keeping a fleet in being come before them.

Upon the bases devolves the duty of implementing the broad operational policies. Theirs is the responsibility of actually directing the ships to sea, and of ensuring their efficiency for the work that lies ahead of them. Repairs and refits have to be arranged for individual ships so that the striking force of the fleet as a whole shall not be impaired. Again Canada has reason to feel proud of the manner in which she has risen to war's emergency, for the Naval Minister was able to report to the House of Commons that the work in Canadian yards "is done in approximately the same time and with the same skill as is shown in the yards of the United States and the United Kingdom".

From these bases then, Canada's ships of war steamed seaward. Each, to use age-old naval phraseology, "being in all respects ready for sea and to engage the enemy". From Canadian ports, marshalled,



The seaman of to-day has to be a man of many parts, for the calls upon his skill and his training are many. These photographs show some of the duties which seamen must be ready to undertake. Reading from top to bottom:—

First panel:—

The naval crew of a merchant ship's anti-aircraft gun at their posts. The Coxswain, the Senior Petty Officer of a corvette, at the wheel. Beside him is a seaman in charge of the engine room telegraph, ready to transmit to the engine room the orders he receives from the bridge.

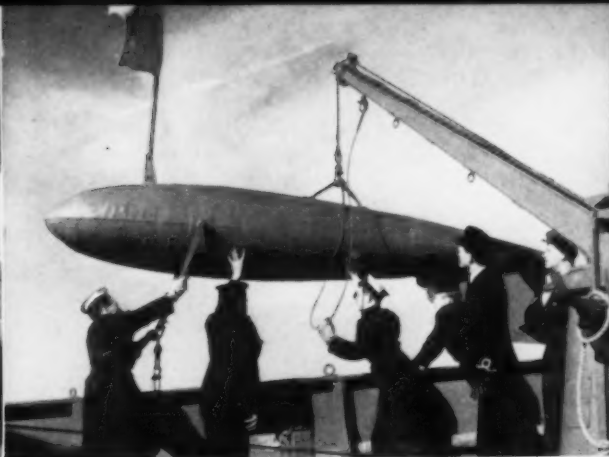
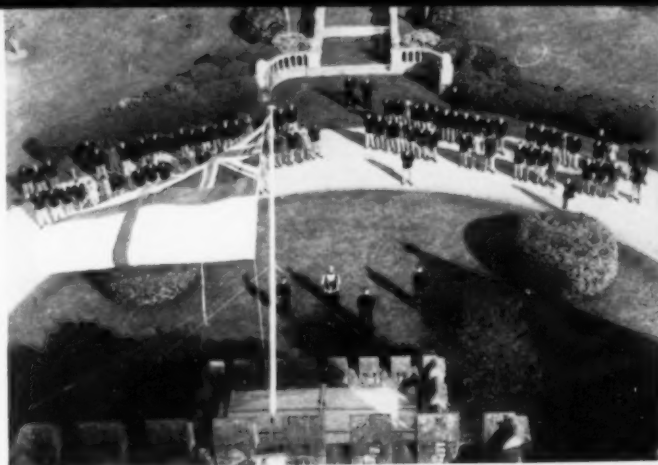
An anti-aircraft gunner.

Second panel:—

Signalmen must be able to send and receive messages by flashing lamps, semaphore or flags. Here a signalman uses a flashing lamp while a leading signalman takes the reply.

Machine guns are familiar weapons in the Canadian Navy.

If necessary, seamen can fight ashore, and practice in landing parties is conducted whenever possible.



Third panel —
Scores of officers in training have passed through Royal Roads which, before its opening last month as the new Naval College, was an officers' training centre. Here are some of an earlier class of officers at Divisions.

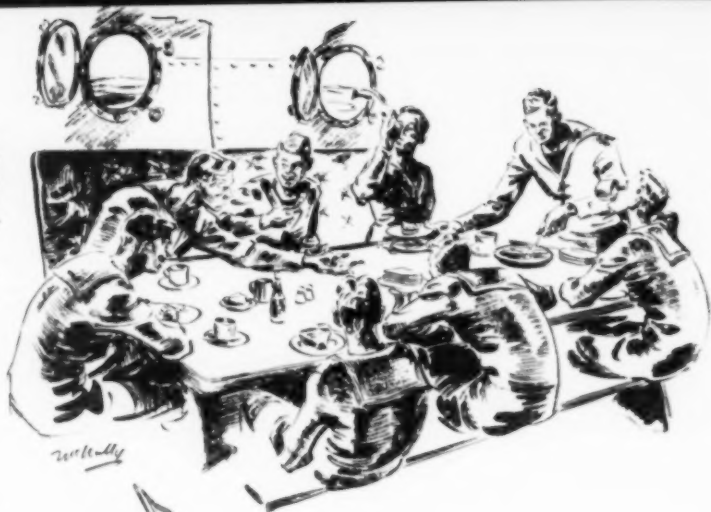
The Services work well together, as these two photographs of practice in Combined Operations show.

Fourth panel:—
Minesweeping is an important part of the Navy's work. The float, here seen being lowered overside, marks the course of the mine-sweeping gear.

More practice in Combined Operations

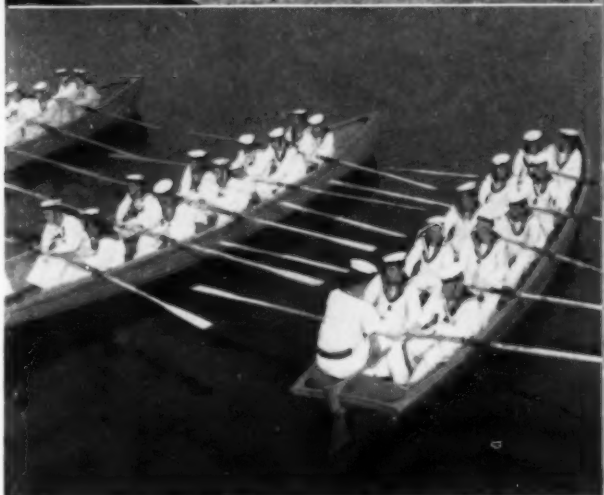
A 6-inch gun at practice







Sea Cadet Corps, sponsored by the Navy League of Canada, come under the jurisdiction of the Department of Naval Services. Hundreds of former sea cadets are now on active service. Their successors, shown above, take voluntary training against the day when they, too, may be ready to join the Navy-proper. Signalling, physical training, boat pulling and rifle drill are in their curriculum. These photographs were taken at their summer camp on Georgian Bay, Ontario.



Bottom:—Two Canadian seamen, on leave in Old London, the heart of the Empire, make pilgrimage (as all seamen do) to Nelson's Column in Trafalgar Square. Nelson's Column, incidentally, is put to war use these days, carrying placards which bear the message "The Navy carries on! So must you in war savings".





Canada's naval officers have the extensive training facilities of the Royal Navy to call upon. Two engineer officers, in training at a British centre, are shown above at work on an aeroplane, for, in addition to ships, they must also be conversant with the mechanical needs of flying craft. Below is shown a naval rating serving as a gunner in a defensively equipped Norwegian merchant ship.



At a Canadian shipbuilding yard more ships for the Royal Canadian Navy are being built. These photographs (above and below) show minesweepers launched and nearing completion. Canadian shipyards have, since they were first geared to war-time production, launched scores of fighting escort ships.



directed and safe-guarded by that section of the Navy which operates under the non-revealing and unromantic title "Trade Division", with its routeing and convoy subdivisions, its naval control service and its staff of officers devoted to the needs of the Merchant Navy, working to the slogan "keep the ships moving and keep them safe", the merchant ships went on their appointed ways.

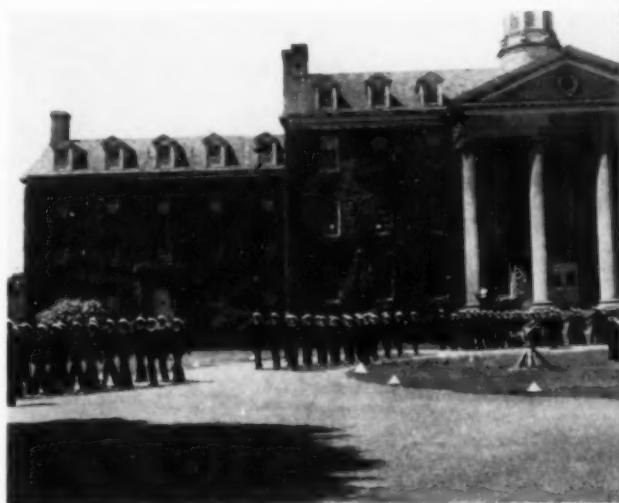
There were losses, heavy ones, as recorded earlier in this article. But, there were successes, too, which cannot yet be revealed. There is one success, though, which can be blazoned in any history . . . the merchant ships kept moving, and the supplies kept going through.

Unofficial figures show that June was the black month of the year in the Battle of the Atlantic, with 109 announced sinkings. Canadian ships joined reinforcements from Great Britain to operate beside their sisters from the United States in convoying on the north and south routes as well as the east and west. The toll of ship losses in American coastal waters and in the Caribbean Sea was steadily lessened. In August, two months



King's College, in Halifax, is another Officers' Training Centre. Some scores of officers-in-the-making are shown at the right on parade.

Two more photographs taken at a Sea Cadet camp, and reproduced below, show a group of boys proceeding, on the double, from their sleeping cabins to instructional classes and a Sea Cadet drum and bugle band leading a route march.





after the "black June" only twenty-four merchant ships were unofficially reported sunk. Once again the United Nations' sea forces had wrested success from near-disaster, and Canada's Navy had played her part.

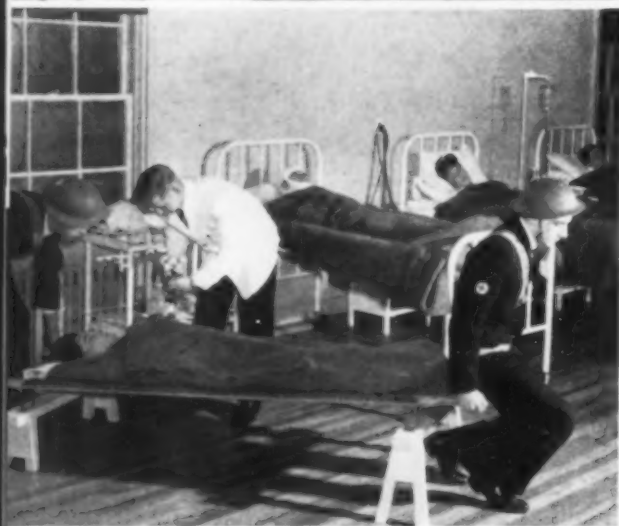
From the United Kingdom came high tribute to the part so played.

The Rt. Hon. A. V. Alexander, First Lord of the Admiralty, speaking in London in August, declared that "a very heavy toll of U-boats" was being taken in the unrelaxing war at sea.

The Canadian Government, he added, "may very well be proud of the part which the ships of the Royal Canadian Navy are taking."

British press comment was equally encouraging. An example is an editorial in the *Daily Telegraph* which said, in part, that the Dominion's Navy "has become a force able to make the utmost of the strategic advantage of its bases in the U-boat campaign . . . It will assuredly give a good account of itself over its own third of the North Atlantic."

Entry of Japan into the conflict brought yet more demands upon the Navy, now faced with the duty of guarding her country's shores on two oceans. It was a far cry from the day which had seen four of Canada's six pre-war destroyers drawn



The marvellous growth of the Royal Canadian Navy has been efficiently paralleled by the growth of the Naval Medical Service, the Senior Officer of which is Surgeon Captain A. McCallum, R.C.N.V.R., V.D., M.D., Medical Director General. Doctors, in their scores, gave up their private practices at the call of war to don naval uniform and serve, ashore or afloat, the men of the sea. This year, too, a Naval Nursing Service was instituted, the nurses bearing rank equivalent to sub-lieutenant. Three Matrons, with rank equivalent to lieutenant, were also appointed. Hospitals were built where necessary at the naval bases so that the needs of sick or injured navalmen could be cared for competently. Hospital accommodation is keeping pace with the needs of the Service.



Top:—An operation in progress in a naval hospital, with a naval nursing sister assisting.

Centre:—A stretcher patient being brought into a hospital ward.

Bottom:—The Chief of Naval Staff, Vice Admiral Percy W. Nelles, R.C.N., chatting with a seaman patient at one of the base hospitals.

from the Pacific to join her only remaining two in the Atlantic. At that time Canada was, to all intents and purposes, denuded of a Pacific naval defending force, with auxiliary craft practically all which were left. Now, despite the scores of ships she has thrown into the Battle of the Atlantic, Canada has not been forced to neglect the Pacific threat and her naval forces there are stronger than they have ever been. It would, of course, be unpolitic to try and enumerate, even roughly, the ships, but it can be said that the ubiquitous corvettes are on duty with the other classes of war vessels off this "Second Front".

The Pacific Coast is a long one over which to keep watch and ward and, in the third year of war, Canada, for the first time since she had become a Dominion, came under enemy fire. In a hit-and-run raid, similar to one or two already experienced by the United States, a Japanese submarine shelled a small settlement named Estevan.

The attack on the Dominion Government telegraph station at Estevan Point on Vancouver Island occurred on the night of June 20. There was no damage, other than a few windows broken by the concussion of exploding shells. Like the entrance of Nazi submarines into the St. Lawrence, the incident was a spectacular example of how war had come to Canada from both oceans, but the enemy profited no whit from it.

The Canadian Navy, to which the spectacular is anathema, does not count its successes in incidents. With its ships in two oceans, its men in many seas, it is relentlessly and indefatigably continuing its allotted role . . . to "seek out and engage the enemy". And, as the convoys of victory-bringing supplies cross the Atlantic, the worth of this role is proven.

Top:—The entrance to a base hospital, with two nursing sisters and a surgeon lieutenant

Centre:—A matron and a group of nursing sisters. Nursing Sister A. W. Wilkie, (shown seated at the left) was lost in the torpedoing of the S.S. *Caribou*.

Bottom:—Matron Mrs. E. Stibbard, in charge of the nursing staff at one of the naval base hospitals





The Naval Control Service, a section of the Trade Division, embraces many duties. One of them entails the sending of small parties of highly-trained seamen into all merchant ships which enter Canadian harbours. These parties devote themselves to checking the safety of the ships, seeing that they are properly equipped for the Atlantic battle and taking every precaution against possible sabotage. In the upper right photograph such a party is shown coming on board a vessel. In the lower right they are seen receiving their orders to carry on with their duties. Part of their duties take them into the engine room and the stokeholds, and one of them (upper left) is seen in consultation with a merchant ship engineer. Included among their duties (although this they hardly regard as a duty) is the distribution of comforts to the men of the Merchant Navy, as may be seen (lower left), where a bundle of knitted goods is being handed to a merchant seaman.



To-day the Canadian Navy is taking one-third of the strain of the Atlantic Battle. What of the morrow?

From all across the Dominion men are making their way to the sea, making their way through Royal Canadian Naval Volunteer Reserve recruiting centres; through training divisions which give them their first taste of a seaman's life; through coastal bases where they are readied for the ships that await them . . . and then into the real thing.

The Navy is building surely and steadily.

"A word as to our plans for the future of the Navy," said its Minister in the House of Commons last May ". . . I hope that by March 31, 1943, the Canadian Navy will have a strength of about 44,000 and in the same time I hope we can add not far from 100 ships to our fleet." The personnel figure has already been passed. The list of new ships in commission is already long.

He spoke of other plans. Of the new naval college, opened this October on Trafalgar Day, where cadets of the present can be shaped into officers of the future; of the establishment, for the first time in Canada, of a Women's Royal Canadian Naval Service, sisters of the "Wrens" of the Royal Navy who proved their worth in the last war and are more than doing so again in this. Canada's "Wrens" are not the first women to don the Navy's blue in the Canadian Service. Further mark of the expansion of the naval medical service was the enlistment through the year of seventy-five nursing sisters. With their naval uniforms they donned the single gold stripe of a rank equivalent to a Sub-Lieutenant. Three matrons, in charge of naval hospitals, have a rank equivalent to Lieutenant. Six of the nursing sisters are on duty in the Canadian base in the United Kingdom, and others are on duty at the naval hospital built as part of the base in Newfoundland.

As the Naval Minister continued his forecast of naval growth he spoke of ships—of larger ones which are to be added; of Tribal destroyers, with their four twin 4.7-inch turrets which give them double the gun-fire of the present Canadian destroyers. Modern, deadly ships, these, four of which have already been launched from Old Country yards for the Canadian

Service, with two more already under construction in Canada. And, to a suggestion that Canada might, in the future, add cruisers to her fleet, the Naval Minister added his hope that such might be done.

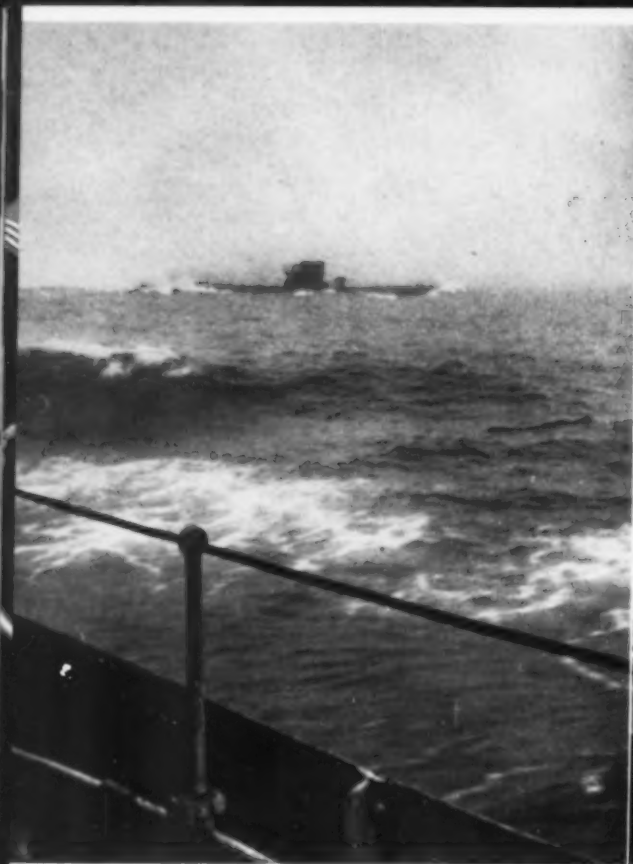
"To the utmost of our ability to produce and man them, we and our Allies must turn out fighting ships to guard our freighters, our tankers, our supply ships of all kinds that are carrying the products of our farms and factories over the seas", Mr. Macdonald declared. For, he added, "it would be vain and fruitless for us to speed up and greatly increase our production of war supplies for overseas unless we could transport those supplies overseas."

Canada is producing the supplies.

And Canada's Navy, produced and manned in Canada, is, equally with the Navies of Great Britain and the United States, seeing that Canada's war effort, instead of being "vain and fruitless", is bulking large on the scales of victory.

At close quarters! That was how H.M.C.S. *Assiniboine* chose to battle a German submarine she had surprised on the surface. The action is an epic of the sea. This photograph, taken at its height, shows how close were the quarters. Further striking photographs are given on the following pages.





One of the most dramatic exploits of the war was the surface action waged between the destroyer *Assiniboine* and a German submarine. The engagement took place in

a heavy fog. The destroyer, skilfully manoeuvred, opened action at such close quarters that the submarine was unable to escape. The enemy put up a hard, desperate fight, shells from their gun killing one man in the destroyer, wounding several, and starting a small fire. *Assiniboine* retaliated with very effective gun fire, depth charging and ramming, and the submarine was sent to the bottom although most of her crew were rescued. The lower left photograph shows the fire party in the destroyer getting the small blaze under control. The other three photographs show at what close quarters action took place, with the submarine visible in each of them.





The two upper photographs show the German prisoners being rescued and immediately below is the destroyer Captain, Lieut. Com. J. H. Stubbs, R.C.N., on his shell pierced bridge. To the bottom right Rear-Admiral L. W. Murray, R.C.N., is shown as he visited the destroyer to congratulate her officers and crew on their success. Admiral Murray had previously commanded H.M.C.S. *Assiniboine*. The right photograph is of the destroyer's officers with Lieut. Com. Stubbs holding the ship's mascot.





This mosaic discloses the topographical features of the area to be developed and gives a clearer idea of the problems to be solved. Proximity of the railway to the orebodies is clearly indicated.

STEEP ROCK IRON MINE

by W. J. GORMAN*

MANY mines in this country have been brought into being under romantic and extraordinary circumstances. One can think of the early Timmins and Kirkland Lake gold discoveries; the famous accident which resulted in the birth of the Cobalt group; the discovery of radium at Great Bear Lake, and legions of other finds. But probably nothing more striking in the way of the discovery and exploration of a mineral deposit has occurred in Canadian mining history than that of the Steep Rock Iron Mine.

Nature was particularly jealous of this deposit, only a few faint hints being offered to the prospector in the form of "float" hematite, found here and there on the south side of the lake. It is true that prospectors of an earlier day found this evidence; it is true that enterprising capital attempted to drill the lake bottom and the shores about, suspecting that the iron riches lay beneath the waters. But these early efforts were not rewarded with success.

Yet the existence of this high-grade "float" tantalized Canadian prospectors for over three decades. Many went and looked at the evidence but either did not have the courage or the capital to carry the action through to a successful conclusion.

In 1937, Julian G. Cross of Port Arthur, resuming the search for iron, revisited Steep Rock Lake and formulated his theories. He and the late Joseph Errington, joined by General Hogarth and associates, then decided to tackle this difficult problem. While Cross gets credit for the discoveries and for his enterprise in securing the ground and bringing the whole situation to the attention of his influential friends, Joseph Errington was truly the father of the project.

Preliminary Work

Although nearly all the drilling had to be done from the ice, in winter time, it is

probable that no mine in Canada ever had a more complete investigation prior to planning production. Geology, geophysics, the diamond drill, underground work, and finally churn drilling, were carried on in the order named. Moreover, the evidence of the drilling was so exciting that the diamond drill and later the churn drill were employed to an unusually extensive degree. For several winters in succession scores of holes, finally to run into the hundreds, were poked into the deposit to extend its lateral and horizontal dimensions. This work was highly successful.

The next step was to submit the data to recognized American experts who had for a long period been successfully employed on the Mesabi and other Lake Superior region iron mines on the American side of the line. These experts were unanimous in accepting the data as indicating an exceptional series of iron deposits, both as to tonnage and grade, with very low impurities.

Handicaps Overcome

Having courageously decided to go ahead and develop for Canada this valuable national asset, the company was faced with unusual difficulties. The deposits lay be-



*Assistant Editor *The Northern Miner*

He fathered the project — the late Jos. Errington backed Julian G. Cross, the geologist who studied the "float" ore which led to the exploration of the Steep Rock Lake deposit.



neath the lake bottom; the lake was 15 miles long and frequently over 150 feet deep; it was quite wide in places and contained over a hundred billion gallons of water. Steep Rock Lake, moreover, is just a deep widening in a flowing river, and at one end there is a privately-owned power plant developing some 10,500 H.P. It became obvious rather early in the development work that this lake would have to be

pumped out, a huge job in itself. But it was also apparent that the Seine River, of which the lake is only an enlargement, would have to be dammed off at its inlet and diverted to by-pass the iron deposits and a hydro-electric power supply procured, not only for the iron mining operations, but also as replacement for the commercial power firm which has rights on the stream.

Plans Considered

It will be readily understood that an undertaking of this nature involved an immense amount of preliminary engineering studies. In addition to the mining engineers, geologists and geophysicists who had to be called in to study the iron ore deposits, hydraulic, hydro-electric and construction engineers and surveyors had to be brought in to determine the best methods of diverting the waters of the Seine River and pumping out Steep Rock Lake. At least six different major plans, with many minor variations, were studied and surveyed before the best and most economical plan of diversion could be decided. Alternative sources of power, transportation and shipment all had to be investigated and considered. This work involved an immense amount of surveying, mapping and calculating. Water flows had to be studied and the levels of many lakes determined, and all the different branches of the engineering fraternity had to be brought into harmony before the final plan was completed and approved. All this consumed a great amount of time and required the services of many outstanding Canadian and American experts.

The reports of the engineers summarizing all data were then presented to the Dominion and Provincial Governments for their consideration. Great credit is due to these governments for recognizing the outstanding economic importance of the Steep Rock development, and for their decisions to give the company every possible aid in getting into production.

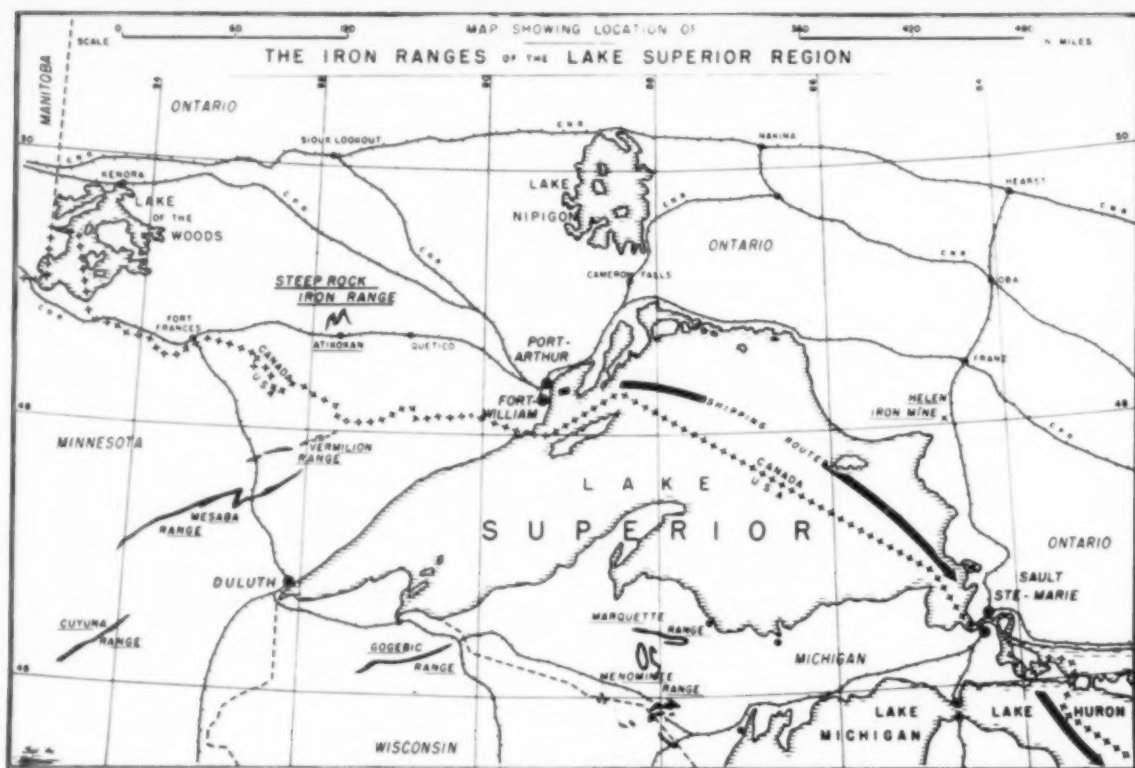
Fortunately, the diversion and draining plan adopted does not involve any difficult or unusual engineering problems: it is simply a big, straightforward job of work.



Above:—The nature of terrain at Steep Rock Lake is indicated. Timber is plentiful but not large in size, and will prove useful for underground mining when that phase of the operation is reached.

Right:—This is the "float" ore strewn in boulders around the lake edge in many places. These stray pieces of ore have interested prospectors and geologists for over thirty years.





Upper sketch shows the location of the Steep Rock Iron deposit, in relation to the famous United States ranges, the Mesaba, Cuyuna and others.

Sketch on left locates the three known orebodies which may be extended for additional drilling and mining operations.

Upper drawing, at right, is a more detailed sketch of "A" ore zone, indicating drill hole locations.

Lower sketch, at right, is a plan of "B" orebody which will be the first mined, by open cut methods.



Julian G. Cross (left) intrigued by the high-grade hematite iron evidence offered in "float" occurrences, staked the ground now covering the water-submerged orebody.



Government Support

The Ontario Government, through the Ontario Hydro-Electric Commission, and the Dominion Government, through the Canadian National Railways, are providing the essential services required. Their contributions are: for Ontario, a power line 125 miles long capable of carrying up to 40,000 HP; for the Dominion, a spur line into the mine, which is about four miles north of Atikokan Station on the C.N.R., and additionally the provision of ore docks at Port Arthur for loading the ore into lake freighters.

The total cost of the power line, the spur line and the docks is estimated at \$5,000,000 to \$5,500,000 which will be furnished by the governmental organizations concerned. The power and freight rates charged the company will include amortization of these sums over a period of years. In addition, the Dominion Government will give a freight subsidy on the rail rate for the first 5,000,000 tons of ore hauled to Port Arthur — a distance of 140 miles. After handling this amount of ore, the railway will have had sufficient experience of the business to set an economic and competitive rate for the future. The diversion of the Seine River, the pumping out of Steep Rock Lake, the stripping of the B ore body in the bed thereof, and equipping the property for large scale open-pit mining will be financed by the company, and involve a sum estimated at \$7,500,000 which has been assured by undertakings in the United States.

Opportune Production

The backing provided by the two Governments was the result of a most searching inquiry into the status of the ore deposits and of the scope of the plans for their operation. The mine will get into production at a time when open hearth high-grade ore will be peculiarly valuable, as the American ranges which are shipping this year in excess of 91,000,000 tons of iron ore to the furnaces, are rapidly exhausting their high-grade lump ore. Of the 100,000,000 tons required for 1943 operations, the steel makers, it is estimated, will need 11,500,000 tons of special grades for open hearth furnaces, while the existing mines can produce only about 1,500,000

Geophysicists were employed early in the exploratory campaign. In the practice of their relatively new science they were singularly successful at Steep Rock.



Dr. A. A. Brant of the University of Toronto headed the geophysical party which carried out the extensive campaign of investigation. Most of the work was done through the ice of the lake.

tons which can be used in the open hearth in its natural form without beneficiation. Increasingly the United States iron ranges are having to treat their ores, either by sintering or some other method of improving the physical character or metallic con-

tent of the furnace feed. Beneficiation, no matter what form it takes, costs money.

What is the known ore position of the Steep Rock as indicated to date by drilling and other work? An engineering estimate follows:

Body	Length Explored	Probable Average Width of Orebodies	Depth of Water to Lake Bottom From—To	Depth of Overburden under water From—To
A	over 3,000 ft. open one end	205 ft.	130—160 ft.	60—220 ft.
B	5,000 ft. open both ends	135 ft.	50—160 ft.	60—120 ft.
C	800 ft. open both ends	200 ft.	210—245 ft.	155—177 ft.

The company has 7,000 acres in contiguous claims along a seven mile length, and several other orebodies are believed to exist in this area as indicated by geophysical results, the presence of ore float and by diamond drilling.

Depth churn and diamond drill holes have shown ore to occur at varying depths

to a maximum of 1,300 feet below the lake; this maximum is merely the greatest depth explored to the present and the company's engineers and geologists see no reason why ore should not extend to considerably greater depths. The length of the ore zones and the suggestion of deep ore structure serves to corroborate competent

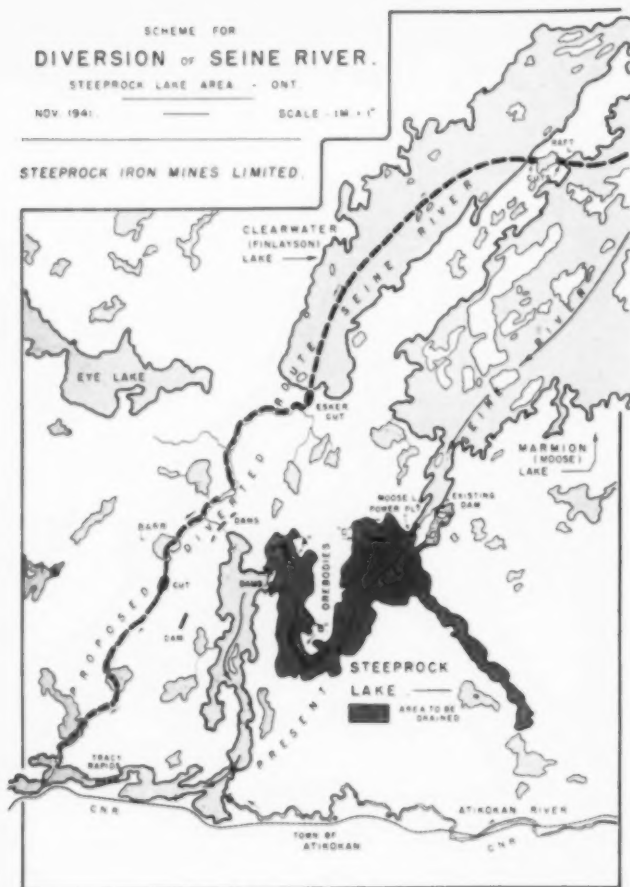
SCHEME FOR
DIVERSION OF SEINE RIVER.

STEEPROCK LAKE AREA - ONT.

NOV. 1941.

SCALE - 1 IN. = 1'

STEEPROCK IRON MINES LIMITED.



(See caption, next page)





Site of the 1,400-foot three-compartment shaft, designed to reach ore horizons and to be connected with the ore by crosscuts. Structure was found to be unsatisfactory until the lake water was removed. This shaft will be used in later operations.

Lower left:—Diamond drilling was the logical step to test the findings of the geophysicists. Over 300 holes were put down through the ice of the mainland, some of them to depths of 1,800 feet. Results were highly satisfactory. M. S. Fotheringham, mine superintendent at left

opinion that Steep Rock may be the largest high-grade, hard hematite mine in North America, producing at the rate of several million tons annually.

The Pumping Job

The opening of the deposits will be facilitated by the fact that depth of water

and overburden in certain places is not great. It will not be necessary to pump every gallon out of the lake in order to get at the ore. The overburden is compact clay, mud, gravel and silt, and the thicknesses of it can be noted above. When the level of water is reduced to disclose the bottom of the lake, however, the overburden will be removed hydraulically or by

Top left:—This sketch outlines the construction work which will have to be done in by-passing the Seine River around that section of Steep Rock Lake which is to be dammed off and pumped out. Earth and rock cuts will have to be excavated and the power plant eliminated. The pumping job will be one of the largest of its kind attempted in North America, but it will be done by stages, and to the hydraulic engineers it is merely an interesting task. Note how the orebodies follow the bed of the lake which is contorted by folds in the structure.

suction dredges and mining can begin, while other parts of the orebody surface which are deeper under water can be attacked later. Engineers estimate that ore shipments can begin 11 months after the pumping starts.

High Grade of Ore

The grade of ore proven by drilling is, of course, important because on the high average iron content and exceptional purity depends the future industrial importance of these deposits. Steep Rock ore is remarkably high in grade and regularly consistent in metallic content. The grade is calculated to run from 61 iron per cent dry analysis or 57 iron per cent natural as shipped taken as conservative for an average. Such ore, lacking as it does penalizing quantities of phosphorus, sulphur and silica, commands a premium in the steel making industry. That premium may run from 20 per cent to 30 per cent of the base price of iron ore at the head of the lakes.

Opinion of Experts

The following extracts taken from the report of Roberts and Crago, recognized

iron ore consultants of Duluth, will serve to emphasize the importance of the deposit:

"The iron ore producers of the United States are straining every resource. The production from the Lake Superior region in 1941 was 81,210,606 long tons. Efforts are being made to produce 90,000,000 tons in 1942, which is about double the normal production. While there are large known reserves in the Lake Superior region, such tremendous annual productions are exhausting the immediately available iron ore very rapidly. Many of the largest open pit mines on the Mesabi Range are actually scraping bottom. It is not possible to increase at once the production of underground mines to a large extent.

"The underground mines that produce the high-grade lump ores required in the final stages of making open hearth steel are being pushed to the limit; there has never been an overabundance of this ore in the Lake Superior region. The war demand has caused the mines to resort to many expedients to obtain lump ore, much of which has not been satisfactory; developed reserves on the American side are rapidly approaching depletion. On the other hand, at Steep Rock, all of the evidence from the past two winters' drilling indicates that at least 25 per cent of the ore that will be produced there is of high-grade, desirable, lump ore variety.

"The Steep Rock ores are not only of Bessemer grade (containing as they do 60.64 per cent iron, .020 per cent phosphorus, 3.43 per cent silica and .017 per cent sulphur dried) but they are extremely low in phosphorus; so low is this phosphorus content that each ton of Steep Rock ore can be mixed with ordinary non-Bessemer ore to produce two or three tons of Bessemer ore. More important, even though it be true that there are large reserves of ore in the Lake Superior region, it is becoming increasingly difficult to produce ores of the average silica content required in the blast furnace, i.e. about 8 per cent.

Right:—Shaft work proceeded at a rapid rate under the direction of W. Samuel, mine manager.

Left:—First round in shaft work at Steep Rock Iron Mine







Riding the bucket with drill steel for the shaft sinking job, on which specially qualified men are employed.



The blasters go below. The hazard in this kind of work is slight when in the hands of experts. Charges and fuses are prepared at surface and the job is done with a special crew.



This view discloses the type of construction undertaken at the shaft site at Steep Rock.



An early view of the head works at Steep Rock. This plant is only four miles from the main line of the Canadian National Railway, at Atikokan, a divisional point.

In view of the extraordinary expansion of production during wartime, this is particularly so as regards immediately available ore. In contrast, the Steep Rock ores are very low in silica, averaging less than 3½ per cent. It is therefore apparent that one ton of this low silica ore may be utilized by mixing with siliceous ore and thus a suitable silica content may be obtained in the resulting product. The siliceous ore so mixed would otherwise not be available unless subjected to some form of treatment requiring construction of plant and increased cost.

River Diversion

The diversion of the Seine River to bypass the lake is a highly interesting bit of work, in which every modern mechanical device will be employed by experts in rock and earth removal. Bulldozers, power shovels, mass blasting, will be used and officials are already on the hunt for pumps, shovels, ore handling equipment and mining tools for the excavation end of the job. The Dominion Government, in line with its policy of active assistance, has agreed

to give this operation a high priority rating. At last Canadians are beginning to wake up to the essential nature of iron supplies.

The geology of the enclosing rock is, roughly, beds of lime rocks on one side and volcanics on the other. The nature of the ore itself and its origin have given rise to interesting scientific argument and speculation, which is not of great moment to the ordinary man; the ore is there and that is the pertinent fact.

When the financial arrangements are concluded, shortly, one of the biggest and most fascinating mining jobs in Canada will get under way. There will have to be close co-ordination of varied types of jobs, such as pumping, excavating the by-pass around the lake, building the 125-mile power line, constructing the spur line and handling works at the mine and providing the ore docks. All told, this is the sort of job that the trained engineer with plenty of experience will enjoy.

What it may mean to Canada is a matter of fascinating speculation at this time. Apart from almost unlimited quantities of high-grade ore for Canadian steel mills, and for export to American mills, the Steep Rock deposits combined with cheap hydro-electric power and using the nickel, cobalt and other alloy metals produced in this country, could mean the establishment of a high-grade steel industry making special alloy steels which would compete in the markets of the world with the long famous Swedish steels, and become the heart of an ever-growing metallurgical and fabricating industry.



The paper work of the geophysicists is as important as the field operations. The operators gather around and interpret and map the electrical reactions in order to form a composite and exact diagram upon which the diamond-drilling programme is based.



Finished shaft head structure and power plant indicate the substantial nature of structures designed for permanent use.

The camp-site at Steep Rock Iron Mine is ideal for mining purposes, with plenty of clearance room for waste and dropping contours for ore handling structures.





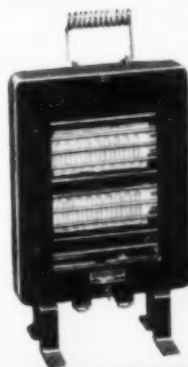
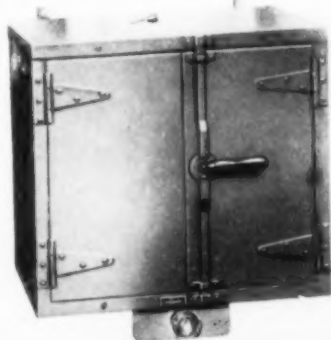
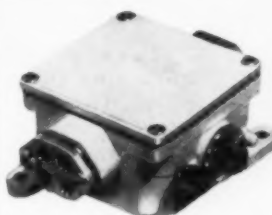
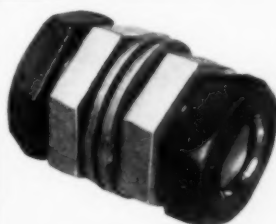
General view of the camp, indicating the expenditure of a considerable sum of money for housing and feeding the crew.



This camp will be greatly increased in size when productive operations begin next year. A great deal of construction remains to be done in the shape of ore-handling equipment and railway facilities.

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REGINA

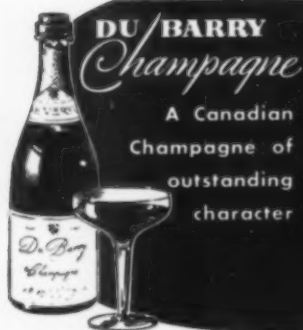
. . . So now, in the
afternoon, we serve
WINE



74

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AMONGST THE NEW BOOKS

Shakespeare's Country, by JOHN RUSSELL (London: Batsford, 1942, 10/6 net). "Now that the air above our capital is no longer bent in the manifold signature of Wren, we look with special appeal to the country, finding a new assurance in each apparent sign of English living. That is why the man to write an area-book just now will not be one native to the country . . . but coming upon the region by an accident of war, an exile before the unhelpful dispersion of country life, seeing the area, not with the golden-wedding tenderness of the local writer, but with impatient, but delighted, analysis."

This latest of the "Face of Britain" series is of the usual high standard set by the Batsford firm, beautifully illustrated with superb photographs, numerous reproductions from drawings and prints, and four plates in colour by well known artists. Mr. Russell shows no signs of impatience in his study of this region of the Western Midlands, which he calls the heart of England, "this gracious intensely English tract, richly gifted by nature and an object of human effort since the first colonizing attempt of the overrunning Romans". As the end-maps show, Shakespeare's country includes Warwickshire, Worcestershire, and contiguous parts of Hereford and Gloucestershire. It is bound by the Cotswolds, the Malverns and the industrial massif of the north. It contains two traffic-laden rivers, the Severn and the Avon, and many smaller ones, the Stoure, the Teme and Lugg, together with canals. "It is naturally well wooded . . . It is a fruiterer's paradise and the vale of Evesham in blossom is lovely as Sparta silvery with olives. Geologically it is freakish . . . but it has also those solid veins of iron and coal which made possible the early and economical encouragement of indigenous industry, when the Restoration had diverted the nimblest wits from politics to commerce. The profusion of wild flowers (of which 7,000 varieties are found near Bredon) is itself an epitome of the generous natural provision of the area."

Yet it is the human resources which are the glory of Shakespeare's country. As Mr. Russell puts it, none other has such splendour of persons. "None has so consistently formed the national taste and reflected the national temper. The history of the area is one of commercial success, decisive political activity, and enlightened patronage. The whole integument of life displays the wise use of ample profits and the splendid fury of conscience in action." And so he proceeds, in a series of brilliant chapters, to narrate its history, the story of cities like Birmingham and Coventry, Tewkesbury and Worcester, their industries and the great variety of crafts and trades practised in the towns and villages—many of them founded by refugees of others wars; and, above all, the outstanding and strongly individual characters who have left their mark in castles and churches and spacious country houses and of the multitude of famous men and women whose names are interwoven through this rich tapestry of central England.

Mr. Russell has brought together a great deal of interesting material on Shakespeare and his family, though he considers that Dickens has put the matter of unravelling the mystery very well. "It is a great comfort to my thinking", he says, "that so little is known about the poet. It is a fine mystery, and I tremble every day lest something should come out." The chapter on *Shakespeare and Stratford* is one of the most delightful in

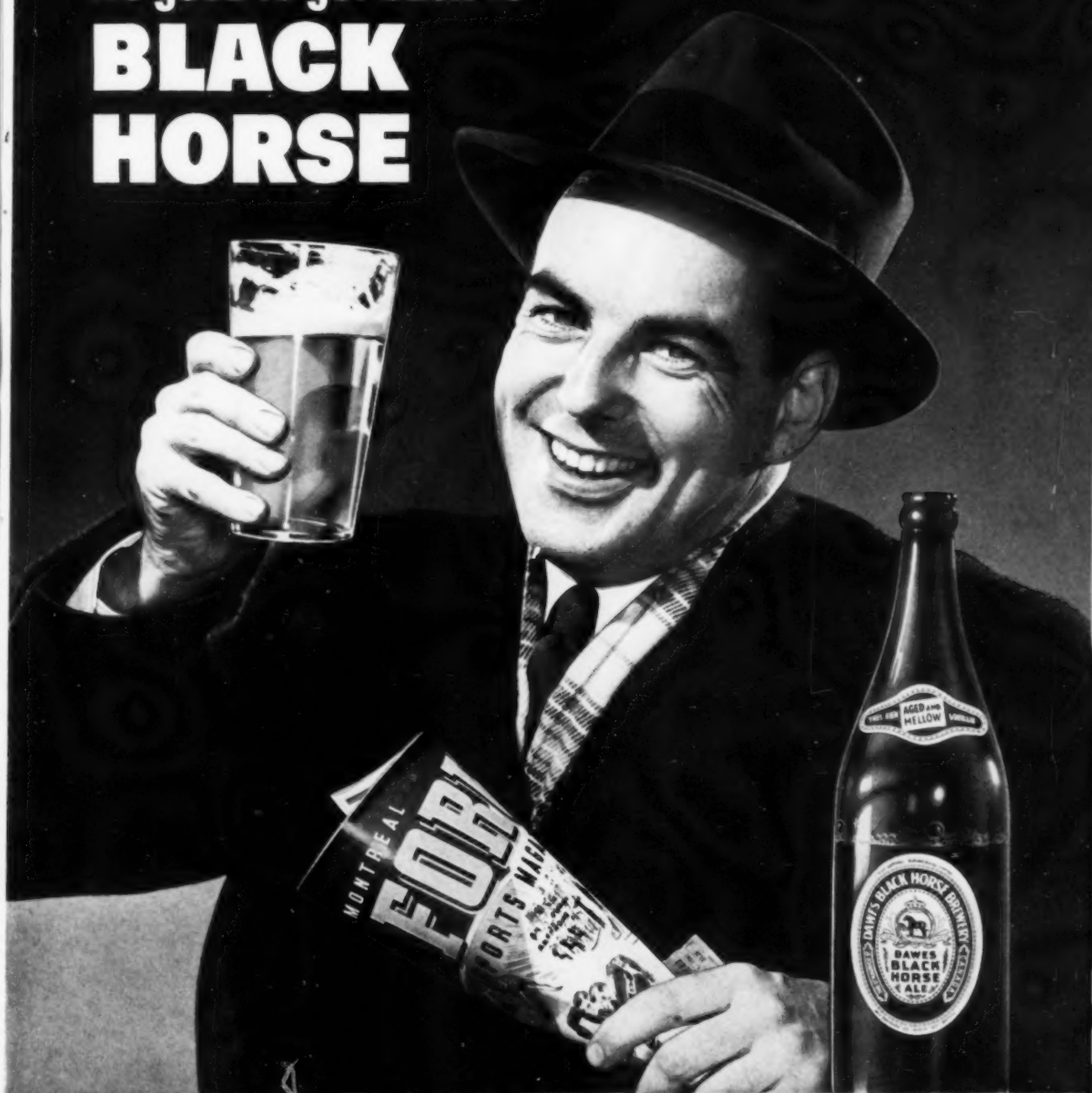
(Continued on page X)



*When the
game's on ice*

It's good to get back to

**BLACK
HORSE**



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(Continued from page VIII)

this charming book. Churches and their craftsmanship and the history and legends connected with the building of the great country houses scattered all over this region seem to hold a special fascination for the author, while his descriptions of the life along the Severn and Avon Rivers and of spas like Cheltenham and Droitwich are choice examples of his "delighted analysis".

This would be a book to send to one's friends overseas especially those in our armed forces who are seeing England for the first time. Mr. Russell has shown that "the smallest exploration of this middle and heart of England can remain a cell of excitement and inquiry in the mind and of refreshment and instruction in the senses." He concludes,—"Long after we have been dragged through the orchards and over the rivers, under the hills and out of the Shakespeare country, there will persist above the alcaics of the train such a heart-breaking song as this of Ivor Gurney's:

Only the wanderer
Knows England's graces
Or can see anew
Familiar faces.

And who loves joy as he
That dwells in shadows?
Do not forget me quite,
O Severn meadows.

F. E. FORSEY

Ireland Beautiful, by WALLACE NUTTING, (Garden City Publishing Company, N.Y., 1925, \$1.98). Lovers of Ireland and the Irish themselves will enjoy Wallace Nutting's enthusiastic descriptions of Irish scenery and architecture and of the life of the people in this remarkably inexpensive book. It contains over three hundred reproductions of the author's photographs, covering all the counties of Ireland. One could wish that some of the places had been coloured in the lovely pastel shades so well known in Dr. Nutting's pictures of Colonial America, and the reproduction of some of the scenes might be sharper and clearer, but these are carping criticisms of a very well-produced and readable book.

"The land of Erin is enchanted ground
Which left a charm from Hesiod's Golden Race
Within its merry folk of fairy faith,
A charm of love and beauty, wit and grace.
A poem is Erin, and a plaintive song
Of passion, sorrow and adventurous joy;
A fallen monarch's dirge, a mother's croon,
The pipes of Pan, a roaming whistling boy."

F. E. FORSEY

Virgin Spain by WALDO FRANK, Duell, Sloan & Pearce, Inc., New York. Price - \$4.50

The author Waldo Frank has long been known as a writer and historian. For some years his chief work has been directed toward the closer relationship and understanding between the Spanish and English speaking inhabitants of the two Americas. Many of his books have been translated into Spanish and are perhaps even better known in South America and Spain than in the United States or Canada.

The present book was first published in 1926 and is now reissued with an additional section on the Civil War and the black tragedy of Spain. In his foreword the author describes his treatment of the subject as symphonic, and perhaps his method can be described in no better terms than in the definition of that word in the concise language of the Oxford Dictionary — "A composition of several contrasted but closely related movements". Mr. Frank weaves into his interpretation of Spain its mountains and bleak plains, the semi-tropical valleys of the south, the peoples of the various provinces — each province differing from another as sharply as though they were separate races but each fitting into the pattern of an homologous Spain. He shows how greatly Spain has drawn from its African neighbours and that the marks of the Moorish conquest and the rich culture, Arabic and Jewish, that arose under the Moorish rulers are still an integral part of the Spanish character. With the reconquest by Castile and Aragon under Ferdinand and Isabella, the Spanish pattern was finally moulded and set by those strong rulers into the Christian and Catholic form which it still bears. Mr. Frank deals at length with the influence of Cervantes and the great work of El Greco and Velasquez and to a lesser extent with modern writers and artists. He believes that the Spanish is a fully adult race, long past the growing pains of the West; mature and fixed for more than three centuries. The sum of all this — a Spain of poverty and extreme wealth — of stinking alleys and proud mansions, of religious processions and bull fights,

(Continued on page XII)

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THE WORLD'S MOST HONORED WATCH

Good
Whisky-



Distilled, blended and bottle in Scotland

**JOHNNIE
WALKER**

BORN 1820 - STILL GOING STRONG

(Continued from page X)

a haughty people dreaming of its mighty past, and over it all the dead windows and blank walls of its thousand convents.

The section on the Civil War is perhaps the most moving and sympathetic in the whole book, though one may not agree with the author in his opinion that the young Republic bore within itself the seeds of its early ruin. The agony of Spain, still so recent that the groans of its victims are scarcely stilled, was only the precursor of the darker night which has now descended over Europe and many other parts of the world, which is motivated by the same passions, directed by the same evil minds, and has exhibited the same cruelty and disregard of human rights as its Spanish prototype.

P. E. PALMER

The Canada Year Book (\$1.50 at the King's Printer, Ottawa).

The 1942 edition of *The Canada Year Book*, published by authorization of the Hon. James A. MacKinnon, Minister of Trade and Commerce, should prove of vital interest to every Canadian. This is the official statistical annual of the Dominion, and contains a thoroughly up-to-date account of its natural resources, history, institutions, demography, production, trade, transportation, finance, education, etc. The new edition has been revised throughout, and provides in all its chapters the latest information available up to the time of going to press. It is carefully indexed, and includes several lithographed maps and many charts and diagrams.

Special articles have been presented to illustrate the effects of the war on Canadian economy, and to show such changes and developments as have taken place to date. In this connection, one finds sections dealing with the following subjects:—Manufactures (pp. 354-361)—an extended review of the rapid changes being brought about in the industrial field is given; External Trade (pp. 434-439 and p. 446)—the influence of the war on world trade is discussed; Prices (pp. 724-725)—a special treatment of the war-time prices control system that has been a distinctly Canadian contribution in the economic field, not only for war-time, but probably for the post-war period also, is provided. The influence of the war on Agriculture, Forestry, Mines, Power, Transportation, Immigration (of British war-guests and refugees), Labour, etc. has also been clearly explained in various chapters by authorities on each of these questions.

In addition, there are important features in the volume which do not relate to the war. Examples of these are: Chapter III—Constitution and Government—contains an extended article on the Evolution of the Constitution down to Confederation; Chapter XVII—Internal Trade—treating the subject of Co-operation in Canada; Chapter XIX—Labour—an account of the set-up of the administrative organization of the Unemployment Insurance Commission.

We have mentioned here only a few of the many sections of major interest to Canadians. A complete list of previously published articles and of historical or descriptive text that has not been subject to wide change, and is therefore not repeated, is given following the Table of Contents. This list links the 1942 *Year Book* with its predecessors, and indicates the extent to which this publication must now be regarded as a series rather than as a single volume.

K. C.